Science WONDER Quarterly

WINTER 1930

HUGO GERNSBACK

Editor

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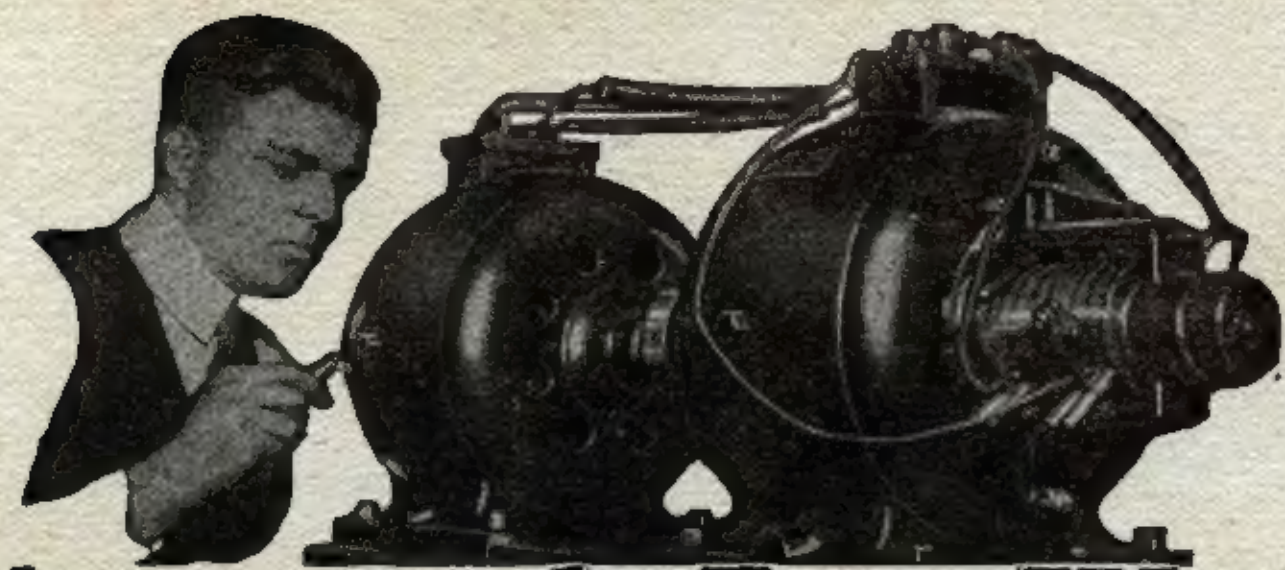

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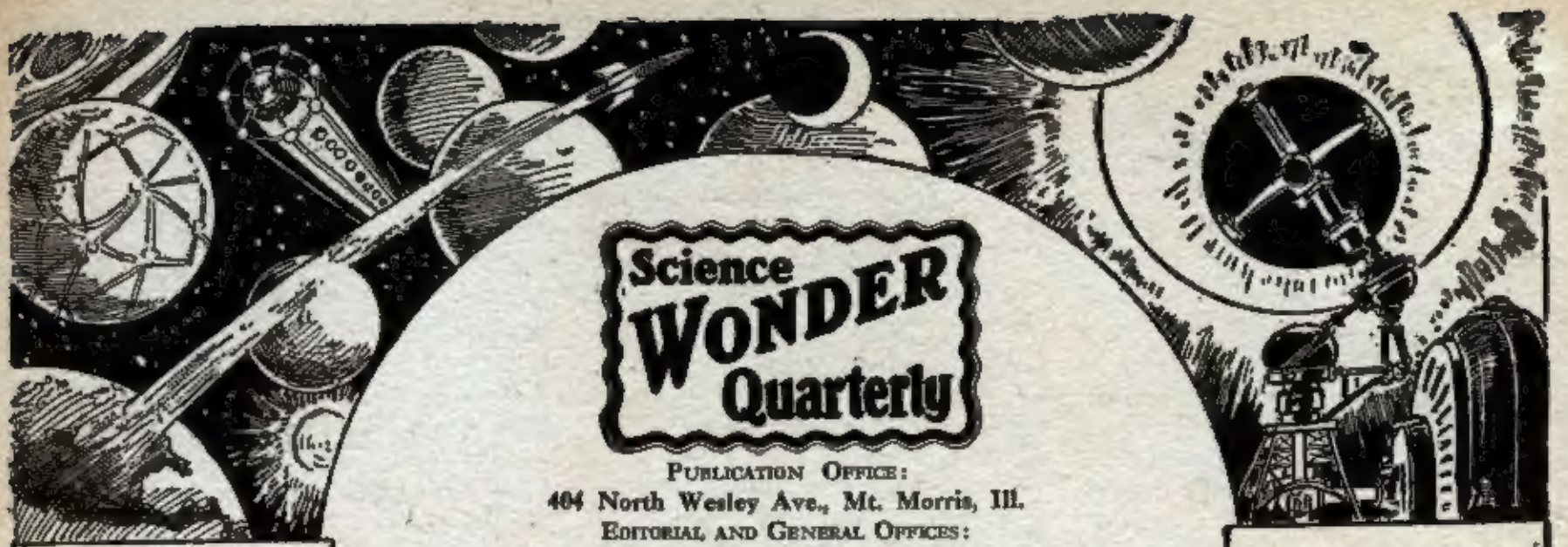

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OUR COVER ILLUSTRATION

shows the Selenite sphere destroying the *Astronaut* by melting it with a heat ray. The Astronauts are already safely in the sphere, altho the observers watching the moon from the "Eye of the World" on the earth believe that the intrepid voyagers into space must surely have perished.

In the background is a beautiful example of a possible lunar landscape showing the deep sharp shadows marking the depressions where the sun's rays have not penetrated.

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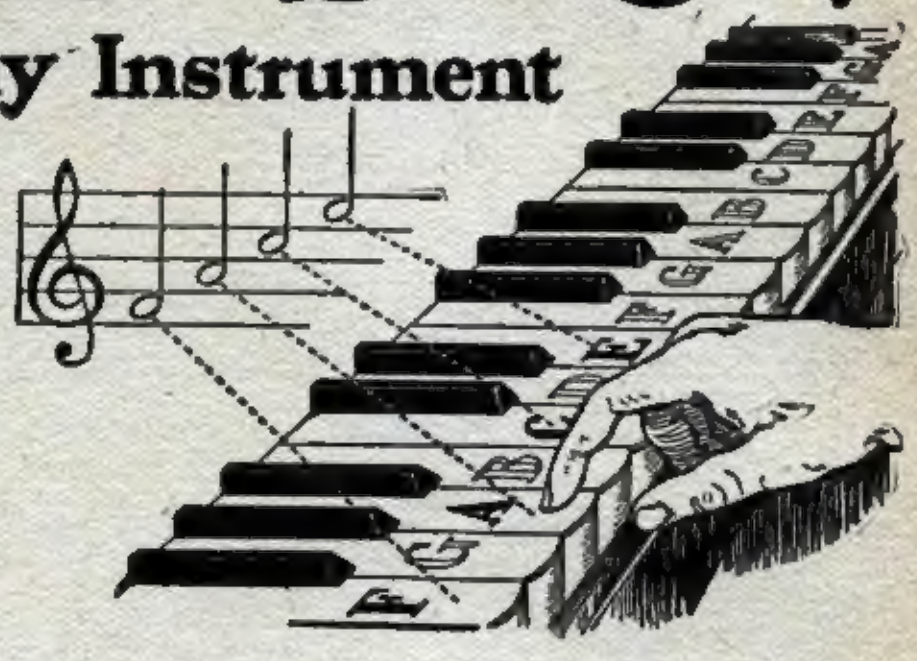
Easy as A–B–C !

You Can Play Any Instrument In a Few Months This Delightful New Easy Way!



Quickest because natural and pleasant. Grateful students say they learn in a fraction of the time old, dull methods required. You play direct from the notes. And the cost averages only a few cents a lesson!

LEARNING music is no longer a difficult task. If you can read the alphabet, you can now quickly learn to play your favorite instrument! That's actually *true*. A delightful new method has made it positively *easy* to become a capable performer within just a few *months*. And the cost is only a *fraction* of what people used to spend on the old, slow methods!

You don't need a private teacher, this new way. You study entirely at home, in the privacy of your own room, with no one to interrupt or embarrass you. Practice a lot or a little, as you like—according to your desire to get ahead—*and enjoy every minute of it!* For, strange as it may seem, the new method is *agreeable* as well as *rapid!*

You Needn't Know a Thing About Music to Take This Pleasant, Rapid Course

Even if you don't know one note from another, you can easily grasp each clear, inspiring lesson of this surprising course. The things you must know are presented in such a concise, graphic way, that even a child can understand them—yet not a minute is lost on unnecessary details. You instantly "get" the real meaning of musical notation, time, automatic finger control and harmony.

The lessons are delightfully *human*. You *like* them. You get ahead fast because everything you have to do is so *reasonable* and so *pleasant*. Even scale practice, the old bugaboo, is reduced to a minimum and made interesting! And almost before you realize your progress you begin playing real tunes and melodies instead of just scales. Thus the course *interests* you all the time—*inspires* you—*encourages*—you.

No Tricks or Stunts—You Learn from "Regular" Music

Yes, the new way teaches you to play from *notes*, just like the best musicians do. There are no trick "numbers," no "memory stunts." When you finish the U. S. School of Music course you can pick up any piece of regular printed music and *understand it!* Think what that means. You'll be able to *read* music, popular and classic, and *play it from the notes*. You'll acquire a life long ability to please your friends, amuse yourself, and, if you like, make money (musicians are highly paid for their pleasant work).

The Surest Way to Be Popular and Have a Good Time

Do you sit "on the sidelines" at a party? Are you out of it because you can't play? Many, many people are! It's the *musician* who claims attention. If you play, you are *always in demand*. Many invitations come to you. Amateur orchestras offer you wonderful afternoons and evenings. And you meet the kind of people you have always wanted to know.

Never before have you had such a chance as this to become a musician—a really good player on your chosen instrument—without the deadly drudging and expense that were such drawbacks before. At last you can start right in and get *somewhere* quickly, cheaply, thoroughly.

How You Learn Any Instrument So Easily This Way

The amazing success of students who take the U. S. School course is largely due to a newly perfected method that makes reading and playing music almost as simple as reading aloud from a book. You simply can't go wrong. First you are *told* how a thing is done, then a picture *shows* you how, then you do it yourself and *hear* it. No private teacher could make it any clearer. The admirable lessons come to you by mail at regular intervals. They consist of complete printed instructions, diagrams, all the music you need, and music paper for writing out test exercises. And if anything comes up which is not *entirely plain*, you can write to your instructor and get a full, prompt, personal reply.

Whether you take up piano, violin, 'cello, organ, saxophone, or *any other* instrument, you find that every single thing you need to know is explained in detail. And the explanation is always *practical*. Little theory—plenty of *accomplishment*. That's why students of this course get ahead *twice as fast—three times as fast*—as those who study old-time plodding methods! Read some of the letters on this page and see for yourself. They don't guarantee that *everyone* can become a good player in three or four months; but they are written by people who didn't know any more about playing when they started the U. S. course than you do now. (Note that if you *do* know something about music now the U. S. School of Music grades and instructs you accordingly.)

PROOF!

Short-Cut Method

"I am making splendid progress and can play almost any piece of music I pick up. My friends used to laugh when I first took up music with you, but now when I play pieces of Grand Opera and selections from Verdi, Mozart, Bach, etc., it is I who laugh. I owe all I have learned to the U. S. short-cut method."

—*J. W. R., Telstad, Mont.*

• • •

Easy as A.B.C.

"I am getting on extra well with your method of teaching—it is as simple as your ads in the various magazines say, 'Easy as A-B-C.' I don't see how anyone could go wrong with it."

J. W., Asheville, N. C.

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How I Made a Fortune With a "Fool" Idea

Learn my money-making secret—Be a Real Estate Specialist—Start at Home, in your spare time—Use my successful System—Free book shows how.

"IT'S a fool idea!"

That's what my friends said, when I told them about my idea for starting a real estate business "on the side."

But with that "fool" idea I made more than one hundred thousand dollars net profit.

No matter who you are where you are, or what your sex or present occupation, if you want to do what I did—if you want to get out of the $25-a week crowd and build up a high-class, money-making business of your own—right at home—in your spare time—send at once for my free book which opens wide the door of the biggest and best money-making business opportunity you ever heard of in your whole life.

Use My Successful System

When I started in real estate, I tossed overboard all the hit-or-miss, haphazard, rule-of-thumb methods of the past, and put into operation a system of my own which is as superior to the old way as the modern mazda lamp is superior to the tallow candle of our forefathers.

With little education—no experience—no influence—and less than five dollars capital—I started in my spare time and met with instant success.

If you want to follow in my footsteps—if you want to use my amazingly successful system—send for my free book now. It tells how I succeeded—how I have helped other men and women win big success—how you, too, can succeed—how you can have a splendid business of your own and make more money than you ever made before.

A well-known Cartoonist's conception of my Idea

A Wonderful Business

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Read These Records

Here are just a few brief extracts from the many letters received from happy users of my money-making real estate system:

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These are just a few samples of success that you will read about in my free book. Get it. Read it. Follow its instructions. Make big money my way.

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Vol. 1 No. 2

Science WONDER Quarterly

WINTER 1930

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..... Prophetic Fiction is the Mother of Scientific Fact .....

What I Have Done to Spread Science Fiction
$500.00 Prize Letters

IN the Fall 1929, issue of SCIENCE WONDER QUARTERLY, we announced a contest in which $500.00 in prizes would be awarded over a period of nine months to writers of the best letters illustrating and *proving* "What I Have Done to Spread Science Fiction." Although we received a perfect torrent of letters, the majority of them had to be rejected because the proofs were too inadequate. We are glad to see, however, that such a large percentage of the letters came from students in our high schools and universities. It is a pity, therefore, where the proofs are obtainable from the records of schoolmates, teachers, and school magazines (a number of the contestants reported that they had written letters in school magazines) that proofs were not forthcoming.

Now, the contest is well under way; we enter the second competition, in which $170.00 will be awarded in the Spring 1930 issue of SCIENCE WONDER QUARTERLY. We urge all those who submit letters to be sure and append the proofs. If you have written letters to your local newspapers mentioning science fiction and its value, or if you have written to your school paper, to your club, to your friends, be sure and forward us a record of these.

What I Have Done to Spread Science Fiction
PRIZE LETTERS
FIRST CONTEST

1st Prize $100	WALTER DENNIS 4653 Addison Street, Chicago, Ill.
2nd Prize $50	VICTOR SZANTON University of Alabama Tuscaloosa, Ala.
3rd Prize $20	JULIUS UNGER 786 Blake Ave. Brooklyn, N. Y.

As we had indicated when we announced the contest, our aim is solely to spread the gospel of science fiction that we all believe in so fervently; and, although subscriptions taken will be accepted as proof for the contestant, this is *not by any means* a subscription gathering contest.

In both the Spring 1930 and Summer 1930 issues of SCIENCE WONDER QUARTERLY we will award three prizes: $100.00, first prize; $50.00, second prize, and $20.00, third prize.

(Continued on page 278)

The Next Issue of SCIENCE WONDER QUARTERLY Will Be on Sale March 15, 1930

The MOON CONQUERORS

By R. H. ROMANS

Illustration By Paul

He showed me the 1200-inch lens, "The Eye of the World," as he had named it. It was located inside of a circular brick building. The giant lens looked like a vast flat dome that could have served as a roof for the structure.

IT is seldom that we have the privilege of reading a story such as THE MOON CONQUERORS. The breath of vision, excellent science, and marvelous construction of the present story, will be hard to equal.

The author, who is a scientist of no mean order, has not only contributed a tremendous interplanetarian story to the literature of science fiction, but he has also added enormously to our future speculations on astronomy and space flying in general. You will find in this story, entirely new scientific developments which, sooner or later, will come about.

R. H. ROMANS

But, best of all, you will find something entirely new, and that is the chapters on interplanetarian history, which present an entirely new departure in interplanetarian stories, and, for sheer daring and imagination, command our respect.

Where did the human race originate? How did some of its races come into being? The author has most interesting answers to these questions. They are not only plausible but daring, and yet, they read most convincingly.

We can only hope that the author may be induced to follow up THE MOON CONQUERORS with a sequel.

The Narrative of Miss Dorothy Brewster

EVER since I was just a little girl, the moon has been the most interesting and fascinating object in my life. Among my earliest memories as a four-year-old, is that of the time I asked Aunt Mary (who was the only mother I ever knew) to get it for me, and she answered it was so high she could not reach it. I could not understand this; for she had never before failed to get me anything I wanted. When I cried for the moon, she thought it was very funny and laughed at me.

Then, in my childish mind, an ambition was born. Today, at the age of twenty-two I am more determined on it than ever. In a measure, that ambition has been fulfilled. I have learned more about the moon than anyone on earth and I can not think of it, except as my own. So far as my fellow men are concerned, the moon belongs to me; but I am still as helpless as Aunt Mary, when it comes to reaching out and taking possession of it.

Even as my childish mind grew more matured, after my great disappointment, the big silvery moon remained the same—the most beautiful, fascinating and mysterious object of my life. I could not learn much about it; some told me it was made of green cheese. Others said it was larger than the earth and people lived on it. Some told me it was red-hot, while others claimed it was covered with snow. Aunt Mary told me it was just placed in the sky so we could see at night; but she could not explain why it did not shine every night. Some of my books pictured on it the smiling face of a man. He was "the man in the moon"—and that was all I could find out about him.

Dissatisfied with these obviously dissimilar answers I carried my scientific research outside of the home, and asked Deacon Jones, whom I considered the wisest man in the world, about the man in the moon. And he told me a story that he had heard from his grandmother when he was quite young.*

According to this story, there was once a wicked man who refused to go to church on the Sabbath day and always stayed at home and burned brush-heaps. He would not listen to his more devout neighbors and live a better life. The sound of his ax and the smoke from his fires ascended into Heaven, and the Lord was very angry with him.

"Man," asked the Lord: "Why do you work on the Sabbath?"

"Oh Lord," this wicked man answered: "I have so much work to do and the days are so short. For six days I cut trees and on the Sabbath, I burn my brush. That is the only way I can get ahead of my neighbors."

"Do you not remember the fourth commandment?" answered the Lord. "Because you have broken it in your greedy effort to get ahead of your neighbors, I will banish you to the moon, where each day is two weeks long. There you may cut trees and burn brush until Judgment Day; and your story shall be an example to all men who persist in breaking the Sabbath."

"Now Dorothy," said the deacon, smiling, "that is the story of the man in the moon as it was told to me fifty years ago. Then it was accepted as the truth; but today no one mentions it."

"But, Mr. Jones," I asked: "Is the moon really a world? Are the days two weeks long there?"

"Yes, and the nights are two weeks long, too. But no one lives there, because there is neither air nor water on the moon."

He then explained that the moon always has the same face turned toward the earth. He told me, too, the reason why the moon apparently changes her shape from "new" to "full"; and why she is always later in rising each night. Some time later he called me to view the first lunar eclipse I had ever seen; and then he let me see the pictures of the moon in his books. He pointed out the so-called "seas" and "lakes," as well as the familiar craters of Copernicus, Tycho and Newton. Before I had ever had a lesson in the geography of our own world, I knew more astronomy than many high-school graduates and more *Selenography*, or lunar geography, than many of the graduates of the larger universities.

A Mysterious Father

WHEN my father came home at Christmas that year (I was then nine), he was amazed and pleased with my knowledge of the moon; but he said:

"Dorothy, I am glad you know the moon so well;

* The version of a nursery story common to many lands was well known a century ago in households of Puritan traditions.—*Author.*

yet there are other things you must learn before you give it such a special study. When you have really learned these other things, I promise to show you the moon as no one else has ever seen it before."

My father was always a mystery to me. I saw him but once a year, when he came home to spend two weeks at Christmas with Aunt Mary and me. The remainder of his time was spent in Arizona, where he claimed to be working a mine. He had always an abundance of money; so Aunt Mary and I never wanted for anything that money could buy. Father said that his money came from his mine; but Aunt Mary (who was really not my aunt, but a widow whom Father had employed to care for me after the death of my mother) told me more about him than he intended me to know.

According to her story, his mine was merely a mask to hide his scientific experiments, and his money was an inheritance. My father, an only child, had inherited a scientific mind from his father, and from his mother over two hundred million dollars, the residuary estate of Caleb Brown, which was once considered one of the largest private fortunes in America.

My own mother died when I was born. Father returned with me to New England, where he left me in the care of Aunt Mary. He then turned all his property into secure investments, which would not require his continual attention, and returned to his "mine" in the mountains.

My eighteenth birthday found me in my last year of high school. My school work had been a pleasure, for I was learning much about the moon. My father had sent me a telescope, ten feet long, which was mounted on a tripod so that I could turn it to any part in the skies I desired to view. Through this, I received my first glimpses of the rings of Saturn, the red spot of Jupiter, the canals of Mars and the dead craters, high mountains and dry sea bottoms of my own beloved Luna.

While other young people were using the moon only as an inspiration for love-making, I was studying it with my telescope. Every time I looked at it, I saw something new and interesting that had hitherto escaped my attention. While my friends were reading love stories, I was perusing such things as Jules Verne's "Trip to the Moon" and serious scientific works on the earth's satellite. As I looked at the moon through my telescope, I loved to imagine myself in the rocket with Michael Arden, Capt. Nichol and President Barbicane. These fictitious characters were to me real men.

"The First Men in the Moon," by H. G. Wells, had an equally great effect on me. With Cavor and Bedford, I often explored the vast caverns, the home of the strange Selenites. Their gravity-resisting material was reality to me. I wondered how it could be made, and often imagined myself the inventor or discoverer of such an element and later using it for inter-planetary travel. I enjoyed thinking of myself as a sort of female Christopher Columbus, whose destiny it should be to open the moon to all mankind. It would be my San Salvador, a small island in the vast sea of space; a stepping stone to the greater worlds that lay beyond. I would establish colonies on the moon, Mars, Venus or any of the worlds that proved habitable. And although these fancies carried me through the length and breadth of space, the moon, which I knew to be a dead world without a breath of air on it, always held the center of my interest.

Father's secret work continually excited my curiosity. It was my dream that he should discover the means to control gravity. But, as years passed and he was growing old without discovering the secret, I naturally hoped to fall heir to the solution of the problem.

When he was home for his annual visit during my last year in high school, I asked him pointedly if he were working on the problem of gravity control.

"No," he said at once. "The control of gravity has always seemed impossible to me. I am devoting my life to the mastery of a problem that I thought could be solved, and I am making a giant telescope with which I hope to be able to see an object on the moon as small as a man.

"No one knows of this except a few trusted assistants, who are sworn to secrecy. When I first started work on this telescope, over thirty years ago, all astronomers and lens makers laughed at me and declared it impossible to build. It would have to be too long. But now the most difficult part of the task is completed; the making of the giant lens, 1200 inches in diameter."

"100 feet!" I exclaimed. "That does not sound possible! Such a telescope must be over a mile long! What machinery will you use in handling it? How could you cast and cool a lens of such proportions?" I became aware immediately of my own scientific knowledge carefully accumulated for years. I would show my father that I was worthy of his confidence.

"I'll explain it all when I show it to you," father said smilingly, "but that will not be until it is finished. Such a lens is not made in a few months; I employed twenty of the best lensmakers of the old world for a period of over twelve years to construct the big lens, while the eyepieces were being made by a firm in Paris. I now have a staff of mechanical and electrical engineers working on the machinery for handling it; but it will be years before the observatory is completely equipped."

"But Daddy, why did you not tell me before? Let me go back with you and help."

"No, you would not be able to help much at present. I have other plans for you. You are to enter college this fall and if you can master such subjects as optics, mathematics, astronomy and their kindred sciences, you could carry on my work when I die."

"Oh Daddy, I'm sure it will. I take to science and mathematics as readily as a duck takes to water; and if I ever marry, it will be to some scientific man who will consider me a co-worker and equal, not a domestic pet."

CHAPTER II

At Brewster

THE next four years of my life were spent in college, where I did my best to break down the old tradition of masculine superiority in scientific subjects. I mastered the subjects my father had prescribed for me and made an enviable record for myself as a student. The moon still remained the object of my devotions; the big telescope in the university observatory opened up many of her mysteries to me. But, in spite of my knowledge that the moon was a dead world, floating in a perfect vacuum, when I saw her I felt a renewal

of my ambition to reach her and carve my name on one of her highest cliffs. For a reason that I could not understand, my father never visited me while I was at college. His letters became fewer, and each read almost like the one preceding it. But always he impressed upon me the importance of completing my education before joining him in Arizona. He was confident, however, that his telescope would be a success.

Despite my pleadings he never visited me. Sometimes, it was his health that would not permit such a long journey; again, some important thing would come up unexpectedly and cause him to postpone his visit. And during my last year, when his letters almost ceased entirely, I became alarmed. I could scarcely wait until commencement was over to go to him.

The last few months seemed like an eternity, but as soon as commencement was over I packed my belongings and bought a ticket for Brewster, Arizona.

The town of Brewster had grown up around a small siding, built for my father, when his supplies were first shipped to that point, years ago. Now, however, it is a beautiful mountain resort, whose chief attractions are the extremely dry climate, incomparable scenery and a modern hotel, which is an oasis to the hundreds of automobile tourists who daily pass the point on the new state highway.

Father did not meet me at the train as I expected; so I went to the hotel to rest, before trying to find him. The proprietor, who was one of the oldest inhabitants of the town, told me about him.

"Yes, I used to know William Brewster," he said to my question: "Years ago he built a fine home about ten miles up in the mountains. You can see it from the window—wait, I'll show it to you."

With his binoculars, I could see the house. It was a large brick building with a red tile roof, looking like the summer place of a millionaire.

"I'd enjoy going up there," I remarked: "Where can I find someone to take me?"

"There are several young men who would be glad to do it; but my advice is to stay away from that place."

"Why?"

"Mr. Brewster is an eccentric old hermit, who long ago advised me to keep my tourists off his property. He owns several square miles of barren mountain land and threatens to shoot all trespassers. He has never shot anybody that I know of, but everyone lets him alone."

It was evident that my informer did not know my identity, so I decided to draw him out and see how much he could tell me.

"What sort of a man is this Mr. Brewster? Does he live up there alone? My curiosity is aroused. I'd like to meet him."

The innkeeper shook his head.

"When I first came here, there was a bunch of foreigners up there; twenty-five or thirty families. But, one by one, they all left for the old country. Brewster owned the place, so he rented it to a club of some kind in Chicago. For several years about one hundred fine American people made this place their headquarters. They always seemed to be busy and there were a lot of motors and machinery taken up there to be installed for some purpose.

"But, about three or four years ago, they all left for Chicago, leaving the old man alone. No one knows what he does now, but he has the name of being as crazy as a bedbug. He comes down here once a month to buy supplies and is always telling people how dumb they are.

"One day he talked about seeing people on the moon and Mars with a big telescope he made. When they heard of it over in Flagstaff, two young men from the Lowell Observatory came down to investigate. As usual, he refused to admit them, but they saw enough to realize that he had nothing that even looked like a telescope. From then on the boys here in town have poked fun at him. But he tells them they are as dumb as horned toads and keeps talking about a daughter who is coming from the East to show them that he is not as crazy as they think. But this daughter has never shown up and the boys think he is crazier than ever."

"Would it surprise you to learn that I am his daughter?"

My question was answered by the amazement that marked his face. He offered an apology for the unkind remarks he had made. But I felt that he had told me the truth, and accepted his offer to take me up to the Brewster house the next morning.

The Recluse

THE distance up the mountain was only ten miles in a straight line, but the crooked road up the steep mountainside was fully thirty miles long, and so steep that it was necessary to drive in low gear most of the way. Even then we had to stop often to refill the radiator and let the engine cool. My driver, knowing that my feelings were hurt by what he had said of my father's reputation, attempted to take my mind from my troubles by discussing other things. But, since he refused to tell me any more, there was nothing to be discussed. However, he did promise to do anything that would be of assistance to me.

At last we arrived at our destination and the driver blew his horn. We soon saw an old man, whom I recognised as my father, coming down the path, a gun in each hand.

"What do you mean by making all that noise? What do you want here?"

"I'm sorry, Mr. Brewster, but here is a young lady who is anxious to meet you."

"We're not admitting young ladies or anyone else today. You are just wanting to bring a woman up here to laugh at me. Turn around and leave or I will fill you full of lead!"

"Wait!" I cried. "Father, don't you recognize me? I am your Dorothy."

For a moment he looked at me. Slowly he lowered his guns, and tears came to his eyes as he spoke:

"Dorothy, I thought I told you to finish school before coming out here."

"But father, I graduated a week ago; are you not glad to see me?"

He looked helplessly from the driver to me.

"Yes. Come in."

I slipped a roll of bills into the driver's hand and told him to return with a doctor as soon as posible. I then passed through the gate, which was locked behind me.

In the house everything was dirt and confusion. Paper, tin cans, empty boxes and excelsior littered the

floor. Father did not seem to be himself at all; he had developed a contempt for humanity that was nothing short of a bitter hatred. He talked about those illiterate tourists and natives down at Brewster, whose intelligence in his estimation was less than that of the ants which they crushed under their clumsy feet. He raved about those would-be astronomers and scientists back East, declaring that they were just as primitive as their ape-like ancestors. They imagined the universe had its beginning and its ending in their teachings, and everything else was absurd and impossible. He declared that any real man with determination, grit and capital could disprove any of their doctrines, just as easily as he had done so with his new telescope.

I hope the reader will pardon me for not detailing all his ravings. He was my father and I loved him; so I will spare myself the painful task of recording the things I find so hard to forget.

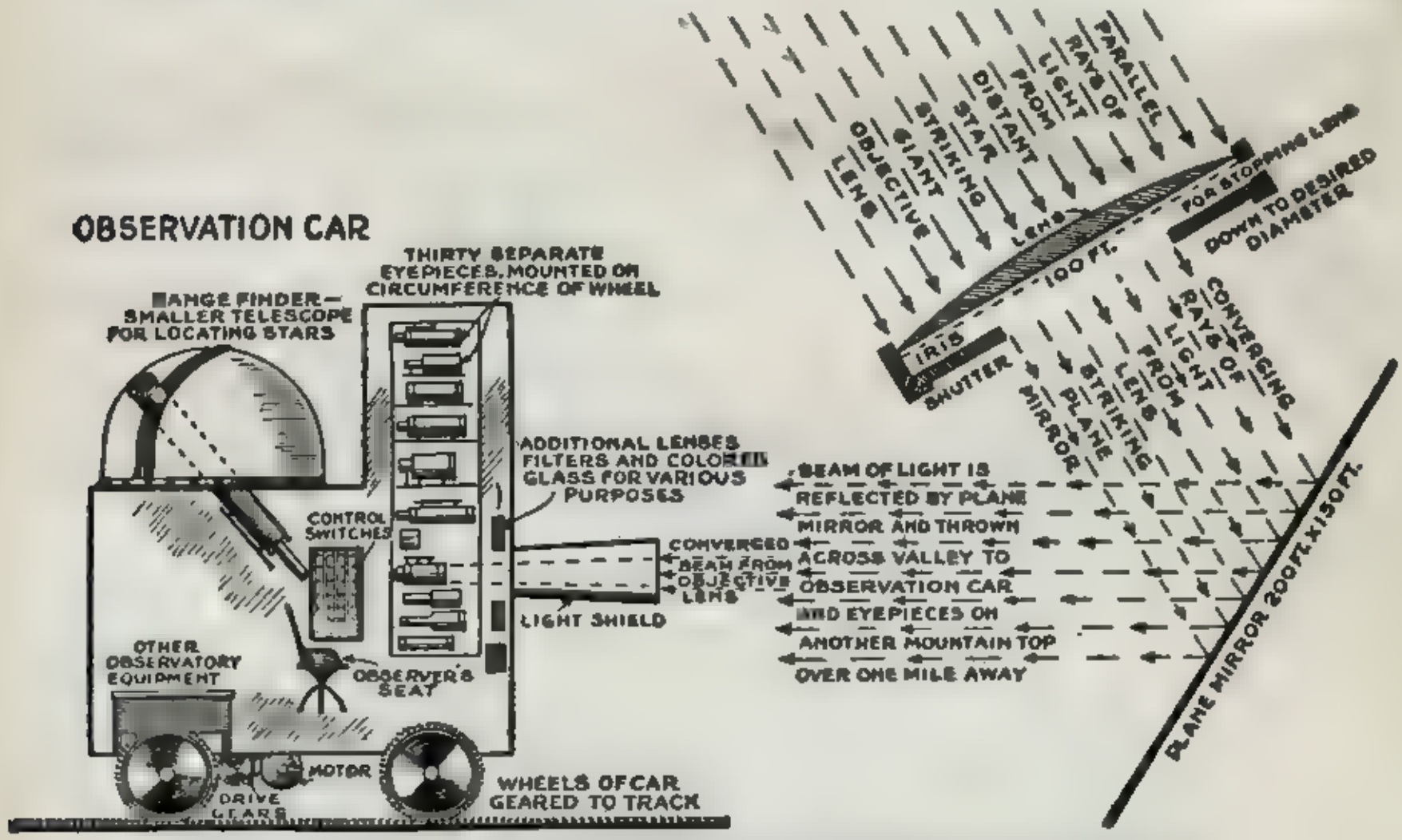
Dr. Zellars called the next day and gave him a very thorough examination. Later he had called me aside and asked a number of questions about his past, and finally gave his diagnosis:

"Your father has worked his mind to death. He has spent a lifetime working on a problem too great for one man; he has never taken any time for rest or recreation and his mind is exhausted. The fact that he has been alone for a number of years is enough to drive many a younger man insane. I have seen sheep herders, with no companion but a dog and thousands of sheep, lose their sanity, temporarily at least, in a much shorter period. Your father's case is similar; but, his mind being stronger, his insanity has been postponed. But he is human and the inevitable can not be postponed much longer.

"His only cure is companionship. He has been looking forward to your coming for years, and your presence here is better than any medicine I can prescribe. Stay with him all the time; talk to him and agree with him in everything as long as he does not want to do anything unreasonable. I am leaving some medicine for him; but I shall call every day and see how this treatment is agreeing with him."

I could see the wisdom of this psychological treatment and the doctor's instructions were carried out to the letter. Father's condition began to improve immediately. During the long hours we spent together, he told me, little by little, of the privation, suffering and loneliness he had endured. He had at first pretended insanity to the people of Brewster for the purpose of checking their curiosity. He was afraid someone would learn his secret, so he prepared to play the crazy old hermit if any scientific men came to investigate. He had purposely boasted of seeing men on the moon and Mars and made his assertions so absurd that they would be considered the ravings of a madman if his secret were suspected.

The telescope had been finished before I entered college, but he did not dare to let me know it for fear I would not finish my education. During the years after its completion, he had looked forward to the day when I could join him and, together, we could explore the



The Brewster telescope—"The Eye of the World". The light from the stars enters the lens at the right and striking the mirror is reflected a mile across a valley, the beams converging in the light shield. Seated in the observer's chair, the operator, by using any of thirty eyepieces, can get any desired magnification. The observation car moves on wheels geared to the track and is operated by moving the wheels holding the eyepieces.

infinite and fathom its hidden secrets. He had made a study of the heavens by himself and learned things of which no astronomer had seen or even science fiction writer had ever dared to dream. His superior knowledge caused him to look with contempt upon the findings of other observers and he began to consider himself almost an equal of his Creator.

But he had forgotten that he was only a mortal, with human limitations. The knowledge and conceit which he had acquired was more than his overtaxed mind could carry. Realizing this he now looked forward to the day when Dr. Zellars would pronounce him cured and permit him to show me his observatory. It is unnecessary to say that this was my greatest desire also.

CHAPTER III

The Giant Telescope

IT was not until several months later that my father was permitted to go ahead with his work. Naturally the first thing he did was to show me the result of his lifetime of labor in the mountains.

It was a cool evening in early fall when I received my first glimpse of the 1200-inch lens, the "Eye of the World," as father had named it. It was located inside a circular brick building on the flat summit of another peak, about a mile away. He decided not to go over to it that evening; but at sundown he would show its operation to me from the observatory on our own summit. He gave me a pair of binoculars and asked me to watch the cylindrical building, while he entered the observation car.

As he explained it, the huge lens and mirror were moved by motors located in the lens-house, for which the control switches were in the observation car, which will be described later. He began manipulating the switches and the entire side of the lens-house facing us parted in the middle and swung open like two doors. Similarly, the roof opened and moved down over the sides of the building, out of the way. The giant lens now rose above the walls, looking like a vast flat dome that could have served as a roof for the entire structure. The dying rays of the setting sun were mirrored in its convex surface, making it an object of rare beauty. He then swung the glass over on its edge, showing me its massive circumference. It turned back slowly until its edge was facing us, and I could not but marvel at its thinness. The steel rim around the edge was all that was visible in the gathering dusk.

Father then called my attention to a large plane mirror, located below the lens, and explained that the rays of light from the star under observation passed through the lens and struck the mirror, which was automatically tilted to the proper angle to throw the rays across the valley and strike a certain point where the eyepiece was located in the observation car. The mirror was moved by separate motors, which worked from the same switch, and were synchronized with the machinery for moving the lens. This made it possible to keep the mirror automatically tilted at the proper angle.

A small telescope, a range finder, was used to locate the star to be studied and mark its position in degrees of altitude above the horizon and its direction from the zenith. The giant lens could be turned to this position and the clockwork mechanism started; which moved the lens slowly, as the earth turned on her axis, following the path of the star across the sky and keeping it under observation.

To demonstrate how it worked, father directed the lens toward Vega, who was almost at the zenith. He said we would not need an eyepiece to observe the effect with this giant star. As the lens moved into position, the mirror became brighter and in a few seconds the concentrated rays from Vega were focused into a narrow beam of light, almost as bright as sunlight. It was the most amazing thing I had ever seen! It was almost impossible to believe that this narrow pencil of bluish white sunlight was coming from a giant sun, a hundred and sixty million million miles, or twenty-seven light-years away!

As the telescope had not been used for some time, father thought the lens must be too dirty for satisfactory observation that night. Consequently, he manipulated a few switches, which caused the lens to drop into position. Then he replaced the roof and closed the doors.

The next day we drove over to the lens-house for a closer inspection of the "Eye of the World." He unlocked a door which led into the large room where the lens hung suspended in its closed position about ten feet above the mirror, which lay flat on the floor. A thin coat of dust covered lens and mirror; so the first task was to clean both. He pressed a button on the wall and a huge iris shutter, resembling the shutter in a camera, slowly began to close. Within a few minutes, it had closed and now lay between the lens and mirror. The purpose of this shutter was two-fold: it could be used for stopping down the lens when too much light was passing through it and it made an excellent platform upon which he could stand while directing the cleaning and polishing the lens and mirror. The lens cleaner was a clever device which acted as a vacuum cleaner, dust mop and lens polisher at the same time; with the aid of levers that could be extended to any desired length, it could reach any part of the surface of either lens or mirror. It required but a little less than two hours to clean and polish the mirror and both sides of the huge lens.

He next showed me the motors and mechanism for moving the lens and mirror. I shall not attempt to describe them, further than to say they were complicated; too complicated to study them out and learn the use of each part at this time. I was more interested in knowing how this great piece of glass had been made.

As father explained, he had first conceived the idea for this telescope while a student at Harvard. Everyone to whom he mentioned the idea had discouraged him, except his father, who realized that the science of light and optics was a deep one, the surface of which had only been scratched.

In an attempt to learn the secret for making the superior French lenses, he stumbled upon a formula that produced a glass superior to the French product. This "Brewster glass" proved to be a speedier lens than the later-to-be-discovered quartz glass. It also had the strange quality of being entirely free from *practically all chromatic abberration;* hence it was not necessary to use a compound lens of both crown and flint glass,

each to correct the faults of the other. The Brewster glass was very easy to work. A lens could be broken in two pieces and fused together again, without the place showing where they were joined. A lens could be made in two or more sections and fused together; making it impossible to distinguish it from a lens made in one single piece. This made the construction of the "Eye of the World" possible.

He found that his glass was immune to moderate changes in temperature; a variation of sixty degrees was necessary before any distortion was noticeable. To guard against atmospheric interferences, so disastrous to large telescopes, he decided to build it in the mountains of Arizona, where the dry climate and atmospheric conditions were most favorable. A large lens and a long focal length made it possible to obtain a maximum of light, while the iris shutter permitted him to use only the desired amount of light to obtain the best results.

Building the "Eye of the World"

A YEAR or more was spent in making plans for the observatory. The size and thickness of the lens, as well as that of the various eyepieces, were calculated to an exactness; when he was ready to begin work on it, he knew exactly what he was going to do. Another year was spent in finding a location that met his requirements: two mountain peaks, the proper distance apart, with one, upon which the lens-house was to be built, exactly north of the observatory summit. When the location was found, he gave a contract to a construction company to build the lens-house, which was to be used at first as a factory in which the "Eye of the World" was to be constructed. He also had erected another large building, in which he expected to house his army of workers while the observatory was being built. Many problems were encountered, among which was the difficulty in moving supplies up the mountain side. A roadway had to be constructed and thus two more years passed before the construction of the buildings could be started.

Then he went to Paris and returned with twenty of the foremost lens makers in France and their families. Nothing but the highest of wages could induce them to come to the wilds of Arizona and stay away from civilization until the telescope was finished. It was during this period, that my mother died and I was born.

The lens was not cast in one piece, but in over eleven hundred sections, each of which was thirty-six inches in diameter. These sections were hexagonal in shape and fitted together like cells in a honeycomb. Each was cast in a separate mold, ground and polished to an exact measurement and fitted and fused in place, giving the finished product the appearance of being cast in a single piece.

It sounded simple when father explained it, but it had been a long and tedious task. Many times he felt like giving up in despair; but only that iron will and bull-dog determination, "The Brewster Grit," kept him going during the long years. But at last, after twelve years the "Eye of the World," on which twenty million dollars had been spent, was finished. It was the largest and most expensive piece of glass in the world—and, as yet, no one could tell whether it could ever be used in a telescope or not.

The large mirror presented the next difficult task. It was essential that the glass used in the mirror should not show even a microscopic variation in thickness. Ten car-loads of special plate glass were brought up the mountain, before there was found thirty thousand square feet of perfect glass from which the gigantic mirror, two hundred feet long and one hundred and fifty feet wide, was made. The mirror was made in 300 sections, each ten feet square, which were fused together and silvered, making the largest mirror in the world. This big piece of glass could not support its own weight; so a flat metal support was placed under its entire area.

While the lens and mirror were being built on the site where they were later to be used, lens makers in Paris were making the set of thirty separate eyepieces, according to specifications and measurements furnished by my father. Each eyepiece produced a different degree of magnification; the most powerful would show on the moon an object as small as a human being, but the field of vision was quite small. Another set of lenses, the other extreme, would show a larger surface of the moon, but the magnification was proportionately lower.

The next difficult task was the construction of the machinery for moving the lens and mirror and holding them in position. This was designed and installed by a staff of mechanical and electrical engineers from Chicago. It was impossible to manufacture the equipment in the mountains; so it was shipped to Brewster and a fleet of motor trucks was worn out in moving it up the mountain. Six more years passed before the machinery was all in place and a high-tension line was erected to supply the motors with electrical energy from Phoenix, ninety miles away.

When we returned from the lens-house, father showed me the observation car and the eyepieces. The car was a building on wheels, which were geared to a straight track full of fine cogs, extending toward the lens-house. The cogs in the wheels of the car meshed perfectly with the cogs in the track, making it possible to gauge the distance from the large lens accurately by the revolutions of the wheels. Upon entering the car, the first thing I noticed was a large wheel, standing upright across the center of the car, upon whose circumference were thirty complicated sets of lenses, comprising the various eyepieces. Father asked me to sit down in the observer's seat and pull the nearest lens into position. As I did so, the car moved slowly forward. I turned the wheel and another eyepiece came down and locked in position, while the car moved slowly forward and stopped at the proper position for that particular lens. Each eyepiece worked at a different distance from the objective lens and the movement of the car on the track was equivalent to the shortening and lengthening of the tube of smaller telescopes. The electrical engineers had arranged a device by which the car would move to the proper position and stop of its own accord, when the lens was in position.

After examining the eyepieces, father next showed me the switchboard for controlling the motors that moved the lens and mirror. Each switch was plainly marked, and their use was quickly learned. He next directed my attention to the spectroscope, astronomical camera and other observatory equipment, with which I was already familiar.

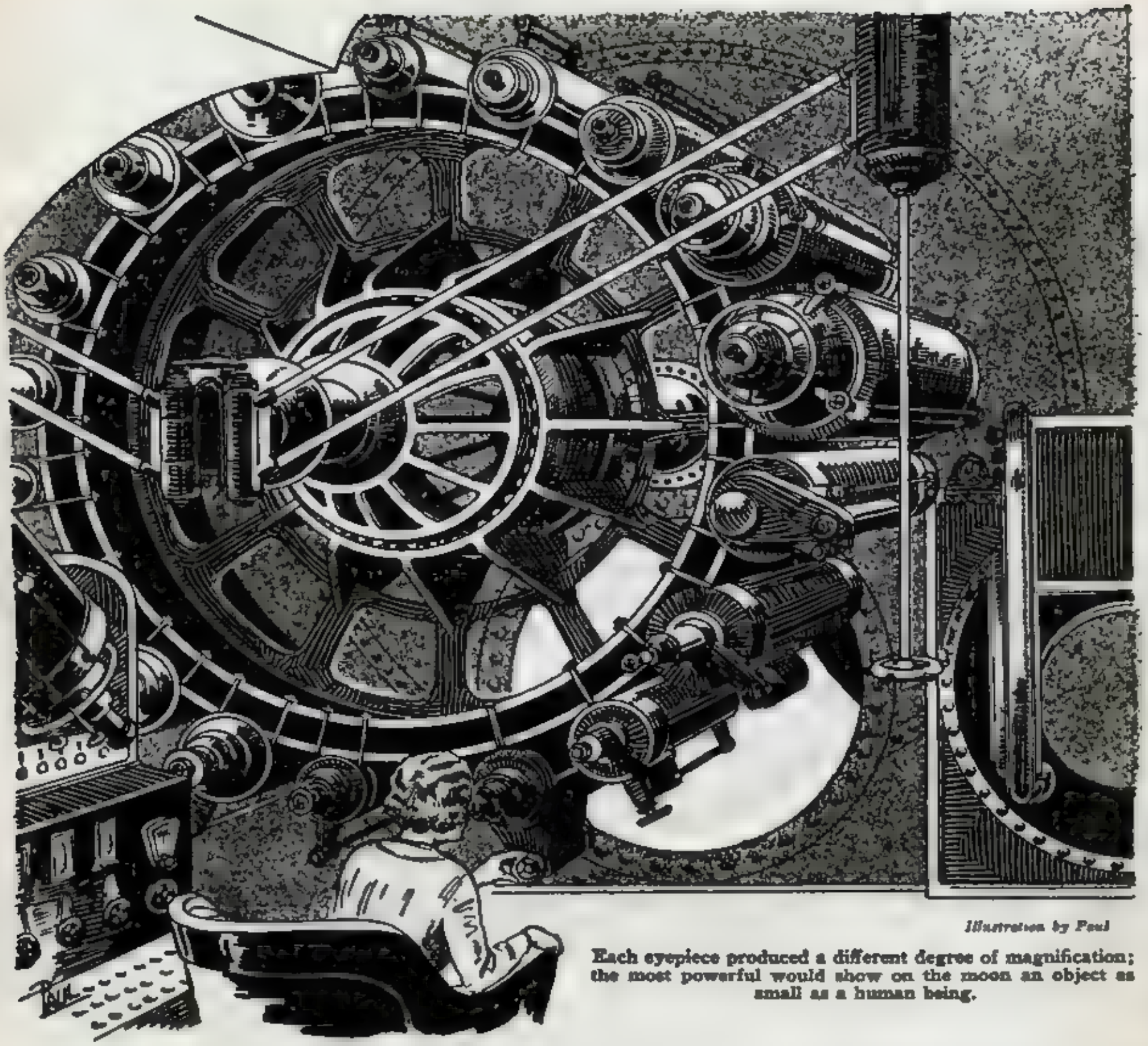


Illustration by Paul

Each eyepiece produced a different degree of magnification; the most powerful would show on the moon an object as small as a human being.

A light-shield on the exterior of the car was the only thing I had not examined; its purpose was to keep outside interfering light from striking the eyepiece. It consisted of a black metal tube, about twenty feet long, pointing toward the lens-house, just in front of the eyepiece. It was all that was required to take the place of the tube of a smaller telescope; as its only purpose was to shield the eyepiece from outside light.

Roaming the Skies

THE warning of Dr. Zellars was entirely forgotten that night. The telescope was ready and the sky was full of stars waiting to reveal their secrets. Father's excited enthusiasm was enough to make one think he had just bathed in the Fountain of Youth. He ran about the car explaining first this device and then that, so rapidly that I utterly failed to understand half of it. He kept warning me about looking at bright stars—"If you are not careful, you will be blinded by their intense rays. When their maximum light is received there are twenty stars that in the telescope appear almost as bright as the sun does to the naked eye. There are about a hundred more that will hurt your eyes. Always open the iris shutter slowly when looking at a new star. Sit down here in the observer's seat and I will tell you every move to make."

Trembling with emotion, I obeyed. Here was the moment we had both been awaiting for years. The greatest desire of our lives would presently be realized when the eyepiece before me would become a window, through which I could look and learn the secrets of the skies. The moment was so dramatic, so full of expectancy, that I hesitated to touch the first switch. To father, it was a common occurrence; but to me it was a sacred rite. The heavens were about to declare the glory of God and the firmament to show His handiwork.

Under father's direction, I swung the lens toward the Great Nebula in Andromeda. Beginning with the weaker lenses, I increased the magnification until the nebula was resolved into stars of varying degrees of

brightness. It was so far beyond the limits of the Milky Way that it was distinguishable as a separate island universe like our own, full of brilliant stars—but just another molecule in the vast cosmos of outer space. I next pointed the glass toward the Milky Way and a thick group of great sun-like stars dazzled my view.

With the enthusiasm of the novice I roamed the heavens looking at a hundred interesting stars and nubulae, but one for never more than a minute at a time. As soon as one was located, I began searching for a new world, a star to add to my list. Father never objected to my using the telescope in this manner. He thought it would be an excellent method for me to learn the use of the controls; as there would be plenty of time in the future to make an exhaustive study of individual stars. But the last thing I noticed before going to bed, was a silvery light in the east, heralding the rising of the moon. I waited until my old friend floated above the horizon; she had already entered her last quarter and I was sorry that two weeks must pass before she would be high enough in the evening sky to reveal her secrets.

After a few nights, Father decided that I was capable of handling the telescope by myself. He was to do his sleeping at night while I was in the observation car, and remain awake in the daytime. I was too interested in the distant stars and nebulae to think of sleep during the night.

One evening while watching the sunset, I decided to sing a song that had long been a favorite of mine: "Beyond the Hills is the Sunrise." It may be superstition or just a sequence of coincidence, but I always imagined that something important was sure to happen when that song was in my mind. And something usually did.

The sunset was more than beautiful—it was sublime. The sky was clear and cloudless and the brightness of the sun was but slightly dimmed as he neared the horizon. Amazed at the unusual beauty, I continued singing as the sphere reddened and slowly dropped behind a distant snow-capped range. Suddenly, I saw something else in the sky that almost startled me—a thin crescent of light, like a delicate shaving of the purest gold from some titanic workroom. It was the new moon, so shy and so new in the evening sky as to be almost invisible. Never before had the moon seemed more beautiful; never before was I more pleased to see my old friend.

Now I was desperately eager to see her. But there were preparations to be made first. The clockwork mechanism was now arranged to synchronize the movement of the lens and mirror with the path of fixed stars across the sky. But in her orbit around the earth, the moon travels more slowly in her nocturnal journey across the sky. It was necessary to lower the weight of the huge pendulum of the clockwork and thus slow down the movement of the lens until it was synchronized with the apparent movement of the moon. I calculated the speed of the moon across the sky, estimated the amount it was necessary to lower the pendulum and submitted my figures to my father.

"You have the right idea," father replied, "but you have forgotten something. You know that the moon increases her speed in her orbit as she approaches the sun and decreases it as she passes from new moon to full? You will find it necessary to lower the weight or raise it as the occasion requires. You will find complete directions pasted on the door near the clockwork, in the lens-house. You will also find it necessary to clean the lens and mirror every day, while studying the moon with a powerful eyepiece. You will find the surprise of your life when you first receive a close-up view of the moon."

"What is it? Is the moon inhabited? Is there really enough atmosphere to support life?"

"For all I know, the little worlds in vast space between the planets are inhabited too. I have found life on the moon and all the planets that I have examined. But it is not exactly the same forms of life with which we are familiar. Evolution, working with different materials, under different conditions, has produced different results. Terrestrial life is not duplicated elsewhere."

"Can life be found on all parts of the moon? Or is it confined to particular regions?" I asked.

"Most of the surface of the moon is desert land, but look at Mare Crisium if you want to see the Selenites."

CHAPTER IV

The Selenites

TWO nights passed before I was able to attempt a look at the moon. Because of the arrangement of the lens and mirror of the Brewster Telescope, it could not be used for observing any star lower than fifteen degrees above the horizon in the south, twenty degrees in the east and west and twenty-four degrees in the north. The lens was located due north of the observation car, which accounted for the variations and limits to which the lens and mirror could be turned. This, together with increased atmospheric interference, made it impossible to view anything on the horizon.

The first night I looked at the moon, observation was not good. Neither was the pendulum adjusted properly and, within half an hour, the moon would be out of the range of vision. The second night, the moon was visible for only one hour and twenty minutes. I did not have time to do much, but of one thing I was certain, I had found the proper adjustment of the pendulum.

By the next night, almost half of the surface of the moon was visible and I had over two hours to look at it. I first used the lowest-powered eyepiece of all, which did not magnify much more than the highest-powered eyepieces of ordinary telescopes. But everything was so much brighter; I had to use the iris shutter to stop down the lens before my eyes could endure the dazzling radiance. I could now see such familiar features as Theophilus, Maskelyne, the Apennines, the various "seas," and Mare Crisium, the "Sea of Crises"—that dark, deep depression on the moon's eastern limb, which father said was inhabited. Using a more powerful eyepiece, I brought the field of vision down smaller until it just covered that ancient sea-bottom, three hundred miles in diameter, surrounded by an almost circular ring of mountains. The black shadow from the high mountain did not now look so dark.

As I used a more powerful eyepiece, the subject apparently moved many miles closer. I was surprised to see the dark shadows become lighter. What could be the cause of this? Was there an atmosphere like our

own in this deep sea-bottom? Hurriedly, I changed to a still more powerful set of lenses and the shadows continued to soften. I could actually see objects within the shadows which were formerly black as midnight. This was almost a direct contradiction to the findings of other observers. Was it "Earthshine" that caused the shadows to soften? I decided that it was; the earth would now appear as but little more than "half-earth" to an observer on the moon and it would be coming from my direction, like a searchlight, eight times as bright as moonlight.

At the time this seemed the answer to me but, as I was later to learn, at full moon, when the earth did not shine on the moon at all, the shadows were still soft. The real reason was this: A lens 1200 inches in diameter admits 625 times as much light as a lens 48 inches in diameter. Sunlight, reflected from objects on the surface of the moon, softened the shadows; but the smaller lens did not admit enough light to make this noticeable on the earth.

But to return to the Sea of Crises. By changing to a more powerful eyepiece, I moved closer to the surface. The interference of the terrestrial atmosphere gave everything a milky, cloudlike appearance, just as if one were looking through a fog. By stopping down the lens, some of this could be eliminated; but the light from the object under observation was decreased also. But a satisfactory position of the iris shutter was found, making it possible to see without too much difficulty.

My first vision of the surface of the moon with the most powerful eyepiece showed an almost level plain, free from both vegetation and sand. No evidence of even the slightest atmosphere was found, and I was inclined to think father was joking when he said life was possible on the surface of the moon. I moved the lens toward the circular ring of mountains and the smooth level appearance of the surface was broken by small craters, many of which did not seem to be more than a foot or two in diameter. Their height in most cases was greater than their diameter. The surface became more uneven as the lower slopes of the mountains came into view. I could now distinguish a form of brown, grassy vegetation. A few minutes later I discovered a small spring of water at the head of a short stream, which ended by soaking into the sand and silt. In spite of the heat from the sun, which has been estimated at two-thirds greater than that received on the surface of the earth, there was no evidence of evaporation. I can give no cause for this; it is just one of the many unsolved mysteries of our satellite.

Illustration by Paul

No creature on earth had feet like these. They looked like large flat caricatures of human feet, resembling big leathery blankets.

An examination of this sparse brown grass led to the discovery of a strange animal that almost defies description. Strange animals or objects can be described only by a comparison with familiar things. Therefore, my description of this strange Selenite must be vague and probably misleading. By taking considerable license, this fellow could be said to look like an ape; but an ape looks more like a man than this Selenite like an ape.

At least that was my conclusion. Father who always credited me with too much imagination laughed when I told him of it and said that even with our telescope it was impossible to distinguish objects so definitely. This led later to a conflict over another observation. But let it be said here that father disputed my claim to have seen the features of Selenites.

But as I first saw one, he was eating this coarse brown grass, using his forefeet or apelike hands to feed himself. He walked erect like a man, but his arms were long enough to reach the ground. His body was hairless, but the skin was thick and full of wrinkles, like that of an elephant. The head was quite small and presented an apelike appearance. The ears were almost invisible, while two grotesque holes in the face served as nostrils. The jaw was large and massive, but I was unable to see the teeth, to determine whether or not he was entirely herbivorous. His chest was much smaller than one would expect to find on a creature living in a rarefied atmosphere. The abdomen was unusually large, which caused me to think their eating habits were about the same as that of our cattle, who fill their stomachs at opportune times and chew the food at their leisure.

The legs were short and thick, but showed unusual muscular development, which did not seem necessary on a world where the force of gravity was so weak. But his feet were the strangest part of his anatomy. No creature of the earth ever had feet like these. They looked like large, flat caricatures of human feet, but their width was greater than the height of the grotesque creature himself, and the length of the feet was in proportion to the width. If it were not for their use they would look more like big leathery blankets than feet. Fortunately, the feet could be folded up and be made to cover much less territory, while he was feeding.

Soon another of these flat footed Selenites came slowly gliding down the slope of the mountain, using his feet for wings. He had all the grace and agility of an athlete on skis, or some creature from the Arabian Nights, riding a magic carpet. When they attempted to fly upwards, their efforts were more ludicrous. The motion of their feet was comparable to that of a duck, but they moved more rapidly than the wings of a sparrow. This explained both the cause and purpose of those massive leg muscles.

I followed the flight of the pair as they joined the remainder of the herd. Here I saw more uses for these clumsy but useful feet. Some were lying flat on their backs, chewing their cud like cattle, with their huge feet above them like an umbrella to protect their bodies and eyes from the rays of the sun. While on the ground, their favorite means of locomotion was walking on their hands with their umbrella-like feet above them. But the strangest thing of all was to see one wrap his feet about his body like a big blanket and go to sleep. This protection was no doubt needed during the long lunar nights, when, if the estimates of our scientists are correct, the temperature goes close to absolute zero. The finding of life at all on the moon and the fact that these creatures used their feet for gliders convinced me that the moon had an atmosphere, which was entirely invisible. This atmosphere, no doubt, prevented the extreme low temperature from ever being reached, but at this time, I only knew that further study was necessary before any definite conclusions could be reached.

The perfectly natural and serious actions of these creatures made them more ridiculous and humorous than any group of circus clowns could pretend to be. I wish I could have taken more pictures on motion picture film; letting them be shown to an unsuspecting audience in a large theatre or the hide-bound astronomers who deny the possibility of life on the moon.

First Glimpses

THE next night I directed my telescope to the "terminator," that part of the moon which divided the lunar day from the night—to the regions where the sun was just rising. I did not use the most powerful eyepiece this time, because I wanted to see a sunrise on the moon. Beginning at the lunar North Pole, I followed the path of the rising sun down to the Alps and watched those bright peaks and craters rise out of the darkness into the sunlight.

The moon's motion on her axis is very slow. She makes but one complete rotation in about twenty-eight days. At her equator, this motion is only ten miles per hour, very slow when compared with that of the earth, which is one thousand miles per hour at the equator. But, owing to the moon's smaller circumference, the horizon is much closer to an observer standing on the moon. His range of vision would be quite small; an object less than two miles away would be hidden below the horizon, unless of course, that object were rather high. Therefore, as the sunrise travels around the moon at the rate of ten miles per hour, it passes over one mile in about six minutes. This produces a very interesting effect when seen from the earth with a telescope of the proper size. Every second reveals a noticeable change in the shadows on the rocky surface, at this time of the lunar day.

The Apennine Mountains were already bathed in the sun's rays; but the shortening of the long shadows, cast by those lofty summits, was one of the most beautiful and inspiring visions I had ever seen. As I moved the glass southward, I noticed a bright spot appear far to the west, in the darkness of the lunar night. I moved my lens to the spot and selected a more powerful eyepiece; I now recognized the brilliant summit of Copernicus, that lofty, giant crater, fifty miles in diameter, the highest crater on the moon's visible hemisphere. As this mountain slowly raised itself out of Stygian darkness into the magnificent sunlight, I could not control the emotions that rose within me. How would the sunrise in Arizona look to an observer at Copernicus, if he had a telescope equal to mine? It looks beautiful enough to me, when observed from any location; but it is so common that its beauties daily pass unnoticed by the two billion inhabitants of the earth.

I realized that five hours must elapse before the rays of the sun would reach the opposite side of the crater's rim and, by that time, the moon would be out of the telescope's range. I left Copernicus to rise out of the darkness as best he could and moved the glass southward where other parts of the little world were waiting for

the sunrise. The rays of the sun were now striking the "Nubian Desert," or as the old astronomers called it, Mare Nubium. I did not stop to observe anything in detail, but kept swinging the lens southward. A half hour later, I found a very brilliant line leading to the south-east. I used a stronger lens and the line increased in brilliancy. By using the iris shutter to eliminate some of the light, I found that nothing could be seen except this bright line. I could not tell of what material it was composed; but I knew that, if the line were followed to its point of origin, it would lead to Tycho, the greatest mystery of our satellite.

As I examined it closer, I estimated its width at about half a mile. Its brightness, under the strong sunlight, was too dazzling and all attempts to eliminate some of the light proved unsatisfactory. It appeared to be composed of glass; although it might be something like rock crystal or some bright metal unknown to the earth. I changed to a weaker eyepiece and followed the "ray" to its point of origin; which was not the crater of Tycho, but a smaller crater in the side of that bright mountain. It would seem that, at some time in its remote past, when the moon was still cooling, these small craters opened up like huge trench mortars and threw their molten liquid discharge for hundreds of miles. Instead of traveling like a solid projectile, this substance strung itself out like a stream of molten wax and fell over smaller craters, hills and valleys.

The entire crater of Tycho seemed to be composed of this bright, shining substance, the surface of which is not smooth but full of tiny globes, peaks and depressions. Each of these reflected, in its spherical surface, a tiny image of the sun. With the lens stopped down to a minimum, I could see nothing but millions of these tiny solar images. Within the interior of the crater, I thought I could see something moving. Those points of light were changing their position, appearing and disappearing at random. Now and then a bright light would appear suddenly, eclipsing all others near it by its brilliancy. I am positive that I saw dark objects moving within the shadows.

Was it possible that Tycho is still molten like some of our volcanoes? Had I seen bubble-like formations and movements in the lava? No, that could not be; because I had seen neither steam nor smoke and the crater was invisible, except in the sunlight. Were these moving objects some form of animal life, some intelligent beings who were mining this mysterious substance? Was this bright material glass, made by Nature? Was it that brilliant substance found in ancient craters of Africa, known as diamonds? Was it rock-crystal? Was it silver or gold or some more valuable metal yet unknown on our planet? I do not know; if I were to give all my ideas, one would require the patience of Job to read them.

For two more nights I studied the crater of Tycho. Instead of solving its mystery, I only added to it. There is only one thing I can give as a fact: the intensity of the light increased each night as the rays of the sun struck the crater more directly. I will not attempt to tell all I failed to learn, but will pass on to a greater mystery, which I discovered a few nights later.

CHAPTER V

The Sphere

THE moon was almost full and I was busy exploring the south-eastern slopes of the Apennines. I was examining strange forms of animal and plant life and trying to identify a certain animal as the five-toed-eohippus, the pre-historic ancestor of the horse. Suddenly a large shadow passed directly across my field of vision. I attempted to follow it, but it passed so quickly I lost it. Quickly changing to a weaker eye-piece with a larger field I began searching for it. I can not describe the anxiety with which I watched for a glimpse of this dark shadow or the mysterious object that cast it. At last, I found them both and followed them as they passed along the lower slopes of the Apennines and out into Mare Serenitatis, the "Sea of Serenity," the smoothest, but loneliest of the seas we know on the

When I changed to a more powerful lens, I found the moving object to be a sphere, about two hundred feet in diameter. It was made of some wine-colored metal, covered with windows and doors and peculiar metal rods and projections. I estimated its speed at about fifty miles per hour, as it moved across the sea-bottom. No propellers were visible, nor could I believe it filled with gas like our balloons or dirigibles. Here perhaps was the answer to my fondest dream—gravity control for inter-planetary travel.

For a few minutes, my joy knew no bounds. Perhaps I could learn its secret and construct a similar sphere. From what planet had it come? What manner of creatures were inside? Were they exploring the moon, preparatory to making an attack on the earth? Or, worse yet, had they come from the earth?

Had someone actually solved the problem and robbed me of my dream of being the first to go to the moon? I feared the worst, but I had never heard of any plans for visiting the moon. Probably it had been kept secret like father's telescope; but if I could get a chance to photograph them, it would be a secret no longer. At last, the sphere checked its speed and moved to a lower altitude. My opportunity had come sooner than I had expected; the sphere was going to land.

With my hands on the control switches and my eyes glued to the eyepiece, I followed the sphere to the ground. After a few moments, I noticed something on the ground beside it. My suspicions were confirmed. They were men! Human beings! But they were dressed unlike any men I had ever seen or heard of. They wore white sun-helmets, similar to those of a tropical explorer, and a loose fitting, one-piece garment, not unlike a mechanic's cover-alls, but much more neat and dignified. Their faces showed a close resemblance to the Nordic branch of the Caucasian race, but they were lighter and more fair than any I had ever seen. This made me certain that they were neither Selenites nor Terrestrials. The rays of the sun, on any latitude of the moon, would tan their faces blacker than that of any negro. Father had told me that no form of life on the other planets even resembled the human race; so these men must have come from the earth after all

Within a few minutes, more men emerged from the sphere, carrying boxes, some of which were made of this red metal, while others resembled paper cartons. They moved with a perfect naturalness of action, exactly like men of the earth. The low gravity of the moon did not handicap their movements in the least. They were evidently accustomed to it. Thus I realized I had been mistaken; they were natives of the moon after all, belonging to a race, undoubtedly superior to our own.

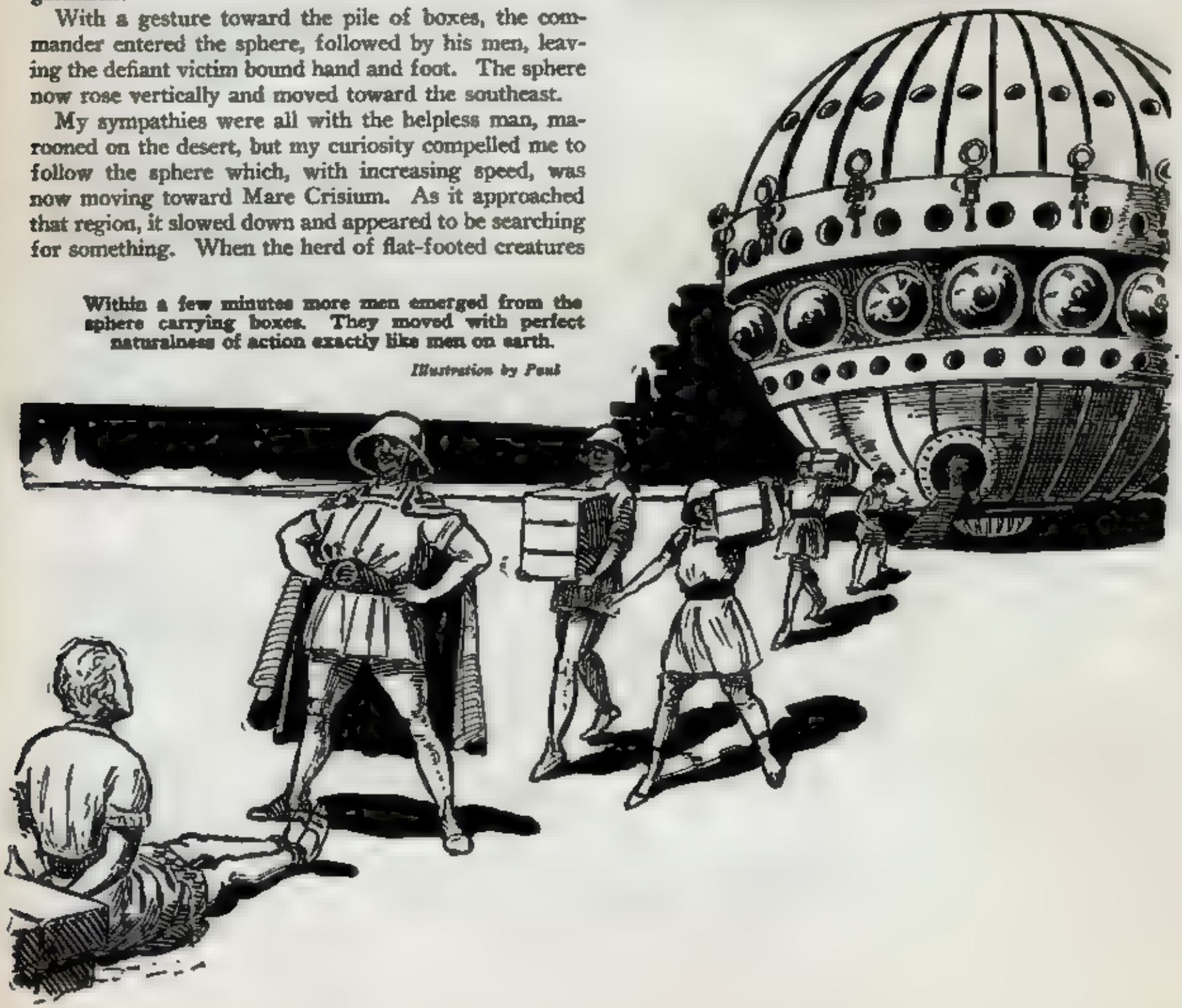
After twenty or more of these boxes had been piled up, another man, evidently the leader of the expedition, emerged from the sphere, followed by others. At a command from the haughty leader, for whom I had immediately taken a deep dislike, six men appeared carrying another who was bound hand and foot. The victim was helped to his feet and the important person addressed him. For a short time they talked and appeared to be exchanging insults. At last, the brave commander walked up to his prey and struck him several times in the face. His followers appeared to cheer this bravery and laugh at his helpless antagonist, whom he struck in the face again and again. Blood spurted from the defiant face of the helpless one and dripped to his white garments.

With a gesture toward the pile of boxes, the commander entered the sphere, followed by his men, leaving the defiant victim bound hand and foot. The sphere now rose vertically and moved toward the southeast.

My sympathies were all with the helpless man, marooned on the desert, but my curiosity compelled me to follow the sphere which, with increasing speed, was now moving toward Mare Crisium. As it approached that region, it slowed down and appeared to be searching for something. When the herd of flat-footed creatures was sighted, the sphere settled slowly to the ground among them. They did not pay any more attention to it than a herd of cattle gives to a passing automobile. They were neither curious nor afraid. Possibly accustomed to it or it may be that fear was an unknown emotion to them. In a world where they had no natural enemies to fear, it is not strange that they did not know fear.

They paid no attention to the commander of the sphere as he approached them. This great personage was now braver than he had been when he struck the helpless man in the fact; as he had left his body-guard inside the sphere.

He removed from a pocket a lens, with which he focused the solar rays to a point, igniting the thick dry vegetation. He then hurried to the sphere and moved just out of reach of the flames, which were spreading death and destruction among the innocent creatures. After the men in the sphere had enjoyed this scene to their satisfaction, they moved onward to the southeast and as the moon approached the western horizon and out of my range of vision, the sphere was passing over the moon's eastern limb, heading no doubt for one of their cities on the other side of the moon.



Within a few minutes more men emerged from the sphere carrying boxes. They moved with perfect naturalness of action exactly like men on earth.

Illustration by Paul

The Man in the Moon

NO sleep was possible for me the next day. But who could sleep with his mind occupied by a strange, cruel drama, enacted on another world? Two mysteries had been discovered and two facts had been learned. The moon was capable of supporting human life and the invisible atmosphere was heavier than our own. This latter was proven by the smoke from the fire in Mare Crisium. With an absence of air currents, smoke rises to an altitude where its specific gravity is equal to the surrounding atmosphere. On the earth, this altitude is often very low, but in Mare Crisium, it rose much high and fast; it was still rising when it had vanished. The fire demonstrated also that the air contained not only oxygen, but some unknown heavy gas which made its atmospheric pressure probably as great as our own, in spite of the moon's weaker gravity. If these were not suffering from the effects of the atmosphere, I was convinced that terrestrial men could endure it also.

But, if the moon was inhabited by human beings, why had I not found evidence of them before? Were all their cities located on the other side of the moon? And if so why was that? Was the other side of the moon any different from the side turned toward the earth? I could not devote much time to these questions, as a more important question intruded itself constantly. Who was this helpless man, whom I had seen marooned on the desert, bound hand and foot, with nothing but a few boxes? Was he a criminal? We this a customary method of punishment? It was all so strange, for his enemies looked more to me like criminals than he. Even had he been a criminal, it was beastly to the highest degree to leave a helpless man alone in such conditions, under a merciless sun that would beat down on him continually for six more of our days and nights. And, too, fire, kindled so ruthlessly in Mare Crisium, was more the act of a criminal than any administrator of justice. This helpless man then was no criminal, but the victim of a cruel and powerful enemy.

When evening came, I was already waiting anxiously for a sight of the moon. She slowly rose above the eastern horizon. As she mounted higher in the sky, she now showed the resemblance of a human face more than ever. But such a face! It was sad and gloomy, as if brooding over some fearful secret. She and I had something in common—a knowledge that was not shared with anyone on earth. Since early childhood, we had spent thousands of nights gazing into each other's face, a quarter of a million miles apart. I had always told her all my secrets, my joys and my sorrows; now, she was revealing her secrets and troubles to me and I received them with an understanding too deep to define.

When the proper moment arrived, I caught the rays of the shining orb of night in my giant lens. A few minutes later, I was scrutinizing the Sea of Serenity. For some time the density of the terrestrial atmosphere interfered with my vision, but at last I located the pile of boxes, the scene of last night's cruel drama. As a more powerful eyepiece moved me nearer to the scene, I noticed that the boxes had been opened and the man was gone. Had the sphere returned and rescued him? Had his friends found him and taken him to a place of safety? The faint foot-prints in the sand answered my question. He had freed himself and was now walking to some haven of refuge. But where could that be? There were no mountains or craters within hundreds of miles.

I brought the vision closer and found the open boxes to contain small oblong cakes, while the metal boxes looked like some sort of a can or container for water. Bread and water! Was that all that stood between this unfortunate man and death? I followed his foot-prints for over an hour before I found him, at a point about fifty miles southwest of his starting point. He was now walking across the hot desert, carrying several of the heavy boxes on his back. He appeared to have been walking without rest, since the night before. Fatigue was showing on him plainly and he soon sat down to rest.

For the first time, I observed him carefully. Last night, I was too engrossed with his contemptible captors, to notice what sort of a creature he might be. Tonight he was alone, so he received all of my attention. When his burdens were removed from his back, he took off his sun-helmet and mopped the perspiration from his face, which was now turned toward me.

And such a face! Such a countenance! It can not be described without taking forbidden liberties with the English language. There is but one word that could describe it, a word denied to the description of men. He was beautiful! His features were as smooth and fair as those of a woman, but the general appearance was far from being feminine. His perfectly-formed face bespoke a possession of power, culture and unlimited courage and determination, even in his present peril. There was about him some superior quality, not of the earth, that prohibits comparison with the most perfect sons of Adam.

His tall, well-developed body was just as magnificent, the clothing failing to conceal the fine graceful muscles beneath it. His muscles appeared to be powerful and well developed; but the efforts required to lift his burdens showed that they were either very heavy or there was some natural weakness that proportioned his strength to the lower gravitational strength of his world.

The moon was his home, his natural element. Nature had adapted his muscles to the gravity of that globe and, if he were brought to the earth, it is doubtful if he could have risen to his feet. But in spite of this natural weakness, there was a sublimity of his splendid body possessed by none of our race.

On to Mount Despair

HIS next move was to take a drink of water. He did not seem to enjoy it, for it must have been very hot. He next opened a box and removed two of his cakes, which he ate without any great relish. From a pocket, he removed a small box, took from it something too small for me to see, and swallowed it. He then sat down for a few minutes and rested.

He soon opened another box and removed a map and a strange instrument, with which he took his bearings. He scanned the sky, as if looking for familiar stars or

constellations to guide him. With his fingers, he made several marks in the sand, mathematical calculations, I presumed, and appeared to be satisfied with the result, for he immediately took up his burdens and moved toward the southwest.

For hours he continued in what was almost a straight line, walking with a steady, rhythmic stride, that no soldier on parade could imitate. Then he would run for miles at a time, with the grace and untiring speed of an athlete. The merciless rays of the sun and the blistering sands must have caused him intense discomfort, but he never faltered. His marvelous will-power and determination proved to be a merciless taskmaker for his tired and aching muscles. Who could watch such a man without admiration, or feel anything but pity for those aching muscles and blistering feet? But he must not stop to rest; his progress must not be checked for a single instant, no matter how great his suffering.

Suddenly, I wondered where he was going. Was there an oasis or a city ahead of him? I moved my lens in the direction he was traveling and followed his path for a distance of over two hundred miles before I found anything that might have been his destination. There was a small volcanic mountain, about two miles in diameter and almost a mile high, directly in his path. It is located near what was once the shore of the Sea of Serenity, in an almost level country. My charts of the moon showed it, but it had never been named. It did not appear possible that the unfortunate man could ever reach it, so I named it Mount Despair. Like all other craters and mountains on the moon, Mt. Despair is full of smaller craters, caves and over-hanging rocks. Near the foot of the mountain, a small spring of water flowed down out of the rocks, only to be soaked up by the dry sands a few hundred feet away. Thick grass and some sort of a scrub pine covered the entire lower slopes of the mountain. Several strange birds and small kangaroo-like animals were to be found near the water.

One particular cave attracted my attention. Its entrance, which appeared to be entirely artificial, had something that looked like two doors. This at least would be a great protection against the cold lunar night, if the poor traveler could reach it. But that was a question. During the last twenty-four hours, he had traveled about one hundred miles; but he had not stopped to sleep. Three more days at that speed, and he would arrive at his destination. But what manner of man was capable of such a journey? It was just as difficult as walking across the Sahara, and that is considered beyond human endurance. Was it possible that Nature, in sacrificing lifting power with this race of Lunarites, had compensated by giving them greater endurance? It did not seem unreasonable, considering the length of the lunar day and the low gravity; no doubt Nature had adjusted them to the conditions of their world.

I moved the lens back to the Sea of Serenity and found him still struggling onward with his heavy burdens. Fatigue was showing on him; he could not continue his rapid pace much longer. His face was worn and haggard, the skin cracked and blistered, giving it a raw beefy look; a consequence of the intense solar heat. For over an hour I watched his tortured efforts as he plodded onward. Suddenly he stumbled and fell.

For several minutes he lay where he had fallen, with his splendid face in the sand. What would I have not given for the opportunity to help him, to lift that handsome but haggard face from the dust and give him a refreshing drink of cool water? But I could only watch him suffer, knowing that we were forever separated by a vacuum, a quarter of a million miles wide.

At last he moved. His face was bleeding from a cut above his eyes, and the blood was drying as fast as it flowed. He removed his burdens from his back and washed his face in the warm water, which on earth would have evaporated on exposure to the sun. Then he removed his shoes and bathed his swollen and bleeding feet. After he drank of his precious water, he ate two of his cakes, and from the box of tablets he swallowed one. This was either some powerful drug with great resuscitating qualities, or its purpose was to remove the effects of fatigue and loss of sleep. Almost immediately after taking it, he appeared to be greatly refreshed, his face took on that former defiant expression of determination and courage; all evidence of fatigue seemed to leave him.

After again taking his bearings and consulting his map, he replaced his shoes and with a smile of confidence, shouldered his burdens and resumed his journey. His step was now that of an untired man at the beginning of a journey.

My admiration for this strange man knew no bounds. Why were men of the earth not like him? Why could they not have his fineness of features, instead of those crude, weak, brutal faces? Why did they not have that godlike intelligence? Was it due to the superiority of his race? Would our men be as splendid as he a few thousands years hence, after we had properly developed?

Or, was there another reason—was it my imagination? Did something cause me to give him credit for more virtues than he possessed, just as father ascribed my entire description of him to my imagination? Was it love? No! Heaven forbid such an impossible thing! What would my father say about such an absurd thing? But it must be true. But I must not believe it. I would not believe that I was hopelessly and madly in love with the man in the moon!

CHAPTER VI

Across the Void

FOR a moment I withdrew from the eyepiece and looked at the moon with naked eyes. She was now far in the western sky, shining with a silvery radiance, brighter than I had ever seen before. How lovely, how distant, how far away she seemed now! That great barrier of distance, erected by nature, seemed greater than ever before, because it cut me off from the only lover I ever had.

If I could have only crossed that void, even for a few minutes, and given him a refreshing drink of cool water or some wholesome, nourishing food, and spoken a few words of comfort. If I could have established even the faintest personal link between us; if he could only know, as he plodded his weary way across that ancient sea-

bottom, that there was on another world one watching him and sympathizing with his suffering.

But that could never be. No invention which our race was capable of producing could span that void. I must continue to watch him suffer and die, without his ever being aware of my existence.

After the moon had gone too low in the western sky to continue my observation, I put the giant lens away. I knew that fifteen hours must pass before I could see him again. Fifteen hours of intense physical suffering for him and fifteen hours of mental anguish for me.

My sleep that night was anything but restful; my dreams were anything but refreshing. The man in the moon had captured my mind as well as my heart—my thoughts, either asleep or awake, were constantly of him. For hours I rolled and tossed from one side of the bed to the other, while I dreamed of my man in the moon. He was calling me, asking for water, for food and for protection from the broiling sun. In his voice I recognized the agony of a man hopelessly in love and it gave me a certain degree of painful pleasure to think that my mad passion for him was being returned.

At last another night came and the moon finally appeared in the east. Her ascension into the sky was slower than ever, as if she dreaded showing me the tragic events. I did not need the telescope to see what she was trying to hide. Her face was no longer a perfect sphere, a portion of her eastern limb was already hidden in the darkness of the lunar night. Within a short time, it would creep up and cover the Sea of Serenity. The man in the moon would then find protection from the torrid heat. But I shuddered when I thought of that other extreme—absolute zero, the temperature of outer space. He must reach Mt. Despair soon or perish.

When the proper time came for using the telescope, I first turned it to the eastern edge of the moon, where the shadows of night were approaching. Already the circular mountains around Mare Crisium were throwing their long shadows across the sea-bottom. Suddenly I thought of those poor flat-footed creatures and the ruthless fire. I brought my field of vision down to the disaster and all that was left of them were black, charred bodies which in the dead ashes gave mute testimony of the terrible tragedy. Those who were still alive sensed the approach of darkness and were hurrying to the shelter of the numerous caves in the mountain. Those who had escaped unhurt were helping their wounded companions in every way possible. This humane act, which is uncommon among the brutes, spoke well for their rudimentary intelligence. I surmised that they stood about midway between that of primitive man and the ape.

But I could not spend much time with these unfortunate creatures, before hurrying over to the Sea of Serenity, where the man in the moon was putting up a desperate but losing fight against the cruel forces of Nature.

I found him about sixty miles nearer his goal. During the last fifteen hours he must have been walking constantly and it was now showing on him. He stumbled and fell every few minutes, under the weight of his heavy boxes, only to rise again and continue his tiresome journey. At last he unloaded his burden, ate his miserable lunch and took his bearings. After swallowing one of those mysterious tablets, he divided his burden and placed half of it on a high rock, where he could find it again. He now shouldered his remaining boxes and moved onward at a greater speed than before.

His progress that night was much slower than usual. His path was more rugged and the lightened burden did not compensate for his increasing fatigue. His drug was losing some of its resuscitating powers, as his body became more accustomed to it. The time would soon come when it would fail to revive him at all and his lifeless form would be lying on the hot sands, shriveling and drying up, under the merciless sun.

During the next seventy-two hours I watched him by night and dreamed of him by day. As his suffering increased, my pity and love for him increased also. By a superhuman effort, he had managed to keep going, though he stumbled at every step and often fell headlong, where he would lie like dead—his tortured face in the burning sands. By a strength of will, I had kept my secret from my father, although at times I wanted to scream out my anguish to him.

How long could I endure this cruel sight? How could I maintain my own sanity? When I looked at a mirror, my image frightened me. I had become so pale and emaciated from loss of sleep and continual brooding that I could not recognize myself. I saw that if this were to continue much longer my fate would be insanity.

This horrible thought brought me momentarily to my senses. "You must stop worrying," I told myself. "Your conduct is unworthy of the man you love. If you can not help him, you can at least help yourself. If he knew of you, would he want you to worry yourself into insanity? A woman worthy of that extraordinary man must be herself extraordinary—one who will not cry herself to death, but follow bravely, face overwhelming odds and at least make an effort to help him. Where is all of that Brewster Grit?"

The Fire

ON the last night that I saw him, he had reached the limits of physical suffering and endurance. His sun-helmet had been lost long ago and I had seen that once beautiful face undergo the terrible stages of sunburn, until it now looked like a half-cooked steak! But determination and defiance were marked on every parched line. His clothing was tattered and torn to shreds; where the tender flesh had been exposed to the sun, it had first been sunburned, then blistered, now broiled and covered with sand and dirt, where he had fallen so often.

Mount Despair was only two miles away, but he was exhausted. His burdens were all lost. Those cakes and that precious, though scalding water was all gone. His condition was too pitiful to describe. He was now crawling on his hands and knees, but worst of all, his greatest enemy was approaching. Night—with its terribly cold temperature in which nothing could live. Only two more hours remained and but two more miles to go.

Was it possible? For an ordinary man—no! For the man in the moon? Time alone could tell.

The details of the remainder of his journey must forever remain untold. I can not endure the torture of describing it. In Hell itself, no more pitiful scene can be expected. His only resource was his admirable grit and determination; his body was exhausted and the sight of his goal did not give him the added strength I had expected.

Thousands of large birds were hovering about the entrance of the caves in Mt. Despair. This was their nocturnal refuge also. If the man in the moon could reach them, he would have food. These birds were unlike any terrestrial birds; the shape of their beaks and feet proved that they were not carnivorous vultures, but some herbivorous type resembling pheasants or chickens, whose skill in flying was equal to that of a hawk. Several small animals, who also sensed the approach of darkness, were hurrying into the caves. But two miles away, in the cool protecting shadow of a huge rock, lay the man in the moon, flat on his face where he had fallen, probably for the last time. Darkness would soon be upon him, but he was unable to continue his journey. His strength was spent and his magnificent determination was broken. Was this the last act—the end of the hopeless struggle in the cruel drama? It was even a relief to think that he was dead and his sufferings were at an end.

With a scream of terror, the truth came to me. He was still alive, but he had rested too long. The dark shadows of night were now upon him. He struggled to his feet, but was unable to stand. His hands and knees were now bruised as badly as his feet; as the shadows of night fell over him, he was dragging his broken body forward, toward the cave in Mt. Despair. The "earthshine" enabled me to see him for a few minutes longer, but our own dawn was now breaking in the east. Every second our atmosphere grew brighter and in a short time it was so dense that I could no longer see anything on the moon. Long after the sun had risen above the horizon, I continued to watch for another glimpse of my lover.

I was no longer a disciple of science, but just a woman—a miserable, heart-broken woman—with all the primitive instincts of one who had just seen her mate dying before her eyes. For a few moments or for a few hours, I do not know which, my actions were not recorded in my memory. My education, my science, my reason and my sanity had left me. I remember wandering aimlessly under the morning sun, but that memory is very indistinct. But I do know that strange noises, crackling and exploding brought me to my senses; I was lying on the ground a hundred feet from the observation car, which was in flames. My first thought was for the giant lens—the "Eye of the World." I had forgotten to put it away, and the intense rays of the sun it collected had fired the car. I was unable to rise to my feet, I struggled, I screamed and then—I fainted.

When I came to my senses, I was in bed and my father was bathing my head with cold water. It was he who had dragged my senseless form from the vicinity of the car and saved the observatory from being a total wreck. The "Eye of the World" was saved, but all the eyepieces as well as everything within the observation car were completely destroyed.

Three months have now passed since the fire, and I am about restored to my former condition. But my mad love for the man in the moon will never leave me. It was a terrible blow to my father to think that within a few minutes' time I had almost destroyed his lifetime of labor. He was in about as serious a condition as I, until Mr. W. O. Mitchell, the chief engineer who had installed the machinery and equipment years ago, arrived from Chicago. After an examination of father's blueprints and old plans, Mitchell announced that a new observation car could be built and new lenses for the eyepieces could be made in Paris, although it would be a long time before the telescope could be again used.

Since I have been able to think properly, a new idea has come to me, that has given me considerable comfort. When our astronomers estimated the temperature of the lunar night at absolute zero, they reckoned without the invisible atmosphere. My knowledge of the weight of that atmosphere convinces me that it is capable of retaining much of the heat during the long night and it may be that the temperature never drops as low as the nights in Alaska. The change would not come as suddenly as the lunar darkness, so the man in the moon was probably waiting until the cool of the evening before resuming his journey, when his goal was in sight.

As I look at the moon, she seems to tell me that the object of my devotions is still alive. Our secret has never been told to anyone. This manuscript, therefore, shall not be made public until my greatest ambition has been realized and I have constructed a space-flyer capable of making the trip to the moon. I have discussed the matter with Mitchell and my father, and they believe the human intellect is capable of solving the problem. Father says he is able to finance any device that Mitchell thinks worth while. Somehow I feel that we will be successful and, after all, perhaps Fate has decreed that the greatest, wildest and most impossible dream of mankind—interplanetary travel—should be solved by the female of the species.

The "Brewster Grit" is again at work. My mind is made up and if capital and human ingenuity, working hand in hand, are unable to solve this problem, it will be their first failure. But with my knowledge of the moon, my motives and my incentives, spurred on by love—the greatest and strongest of all human emotions—we shall not fail. Some day my tortured mind and broken heart will find a haven of refuge and a real welcome in the strong, protecting arms of my wonderful lover, the Man in the Moon.

PART TWO

Foreword

IN the early summer of 1955 the entire world was startled by the unannounced arrival of a space-flyer from another world. As descriptions of the visitor began to come in by radio from different ships on the Atlantic, its identity was established. It was a spherical

ship exactly resembling the one that observers at the Brewster Observatory in Arizona had seen, destroying ruthlessly the *"Astronaut"* on the surface of the moon.

Reports as to the location of the visitor showed that it was moving toward the city of New York. A great alarm, which almost resulted in a panic, spread throughout the city; as memories were revived of how a sphere had melted the steel walls of the *Astronaut*, ten years earlier. Anti-aircraft guns were made ready to fire upon the intruder, if any signs of hostility were shown.

It was a night of hectic waiting, during which thousands of New Yorkers fled from their homes, seeking safety in the less-thickly-populated countryside. The sphere was sighted at dawn, apparently motionless, several miles out at sea. For over an hour, it was watched in breathless suspense. At last it was seen moving slowly over New York harbor toward the Statue of Liberty. Then after spending a few minutes examining the latter, the visitor rose to a height of about four thousand feet and remained motionless in midair. Observers with telescopes saw two windows opened and a white flag, the universal emblem of peace throughout the entire world, displayed. As the news of this spread, the people breathed easier and no alarm was felt as it moved over toward Metropolitan New York. A few minutes later another window was opened, permitting thousands of pieces of paper to fall slowly toward the city, and simultaneously another flag was displayed—the Stars and Stripes.

When the pieces of paper were gathered and it was learned that this message from another world was printed in English, the city was amazed. The emotion of fear was immediately replaced by joy and a celebration was started, which had never been equalled in the history of the city. The message was brief:

> "We have come from the moon, on a mission of peace, of great importance to all the people of the earth.
>
> "We, the builders and passengers of the *Astronaut*, have returned to our own world to establish commerce between the two worlds.
>
> "We regret that we can not make a landing for some time and our story can not yet be told. We consider it your duty to show our visitors from the moon every courtesy. We will be showing them our cities and other wonders of our world, and we may be reached by radio on a wavelength of 230 meters only.
>
> WM. H. HAVERFIELD,
> CYRUS LACEY,
> LESTER WINTERS."

It was a pleasant surprise to learn that Dr. Haverfield and the others who started for the moon in 1945, were still alive. They had long been given up as dead and had all been forgotten by the public. But memories were quickly revived as the news of their return was spread through the entire world.

Just as the celebration was reaching its height, the sphere rose to a higher altitude and moved swiftly toward Philadelphia, and after a brief visit, departed for Washington, where it descended slowly to within a hundred feet of the earth, on the lawn of the White House grounds. A small metal cylinder was dropped to the earth, addressed confidentially to the President of the United States.

In Cleveland, the sphere paused over the roof of the *Herald's* building and dropped a bulky manuscript, the story of the *Astronaut's* voyage, written by George L. Davis, a former reporter for that paper. The earlier material in this manuscript had been published in 1944 and 1945, while the *Astronaut* was being built and prepared for a voyage to the moon. As the younger people could not remember that period, and many of the older men and women had forgotten the details, it was printed in its entirety, in the *Cleveland Herald* and all other papers owned or served by The Universal News Syndicate.

The Manuscript of George L. Davis

CHAPTER I

The Challenge of Space

IN writing a narrative of our recent adventures and present troubles, one must start at the beginning. But where was the beginning? I used to think it started in the gymnasium of Belmont University, although Dr. Haverfield says it started somewhere in Arizona and there was a woman at the bottom of it; just as if this were the first time trouble was started by a woman. But now I prefer to think the trouble all started when Jules Verne wrote his story of a trip to the moon. He started men to thinking and, after fiction writers had been solving the problem of interplanetary travel for three-quarters of a century, a group of people got together with ambition enough, money enough, inventive genius enough and just the proper amount of audacity and dumbness to attempt it. And it was just my luck to get mixed up with them and go along on the first voyage.

Regardless of where the idea originated, my first knowledge of the proposed trip to the moon came to me in Belmont University, sometime in November, 1942. As a reporter for the *Cleveland Herald* I used to go there to cover a football game. On this particular day after I had wired my story to the paper, I hunted up a boyhood friend of mine, who was a senior at Belmont and a quarterback on the football team.

Cyrus Lacey and I had been inseparable friends ever since we entered the first grade in school together and many were the mischievous pranks we had played. And as this was the first time we had met in months a celebration was necessary, even though Belmont had lost the game. At Cy's invitation, I secured permission from the paper to spend several days at Belmont, and I went with him to all his classes.

One morning the students assembled in the gymnasium, which was also used as an auditorium, to listen to a short talk from Dr. William H. Haverfield, the president of the university. And so far as it concerns me, here was the place that all the moon trouble started.

"Students of Belmont," Dr. Haverfield began; "It is not in the least far-fetched or fantastic to say that we are this morning standing on the threshold of a new and greater era. History constantly repeats itself and the earth is about to undergo a change similar to, but greater than the Renaissance of the Fifteenth Century. Fol-

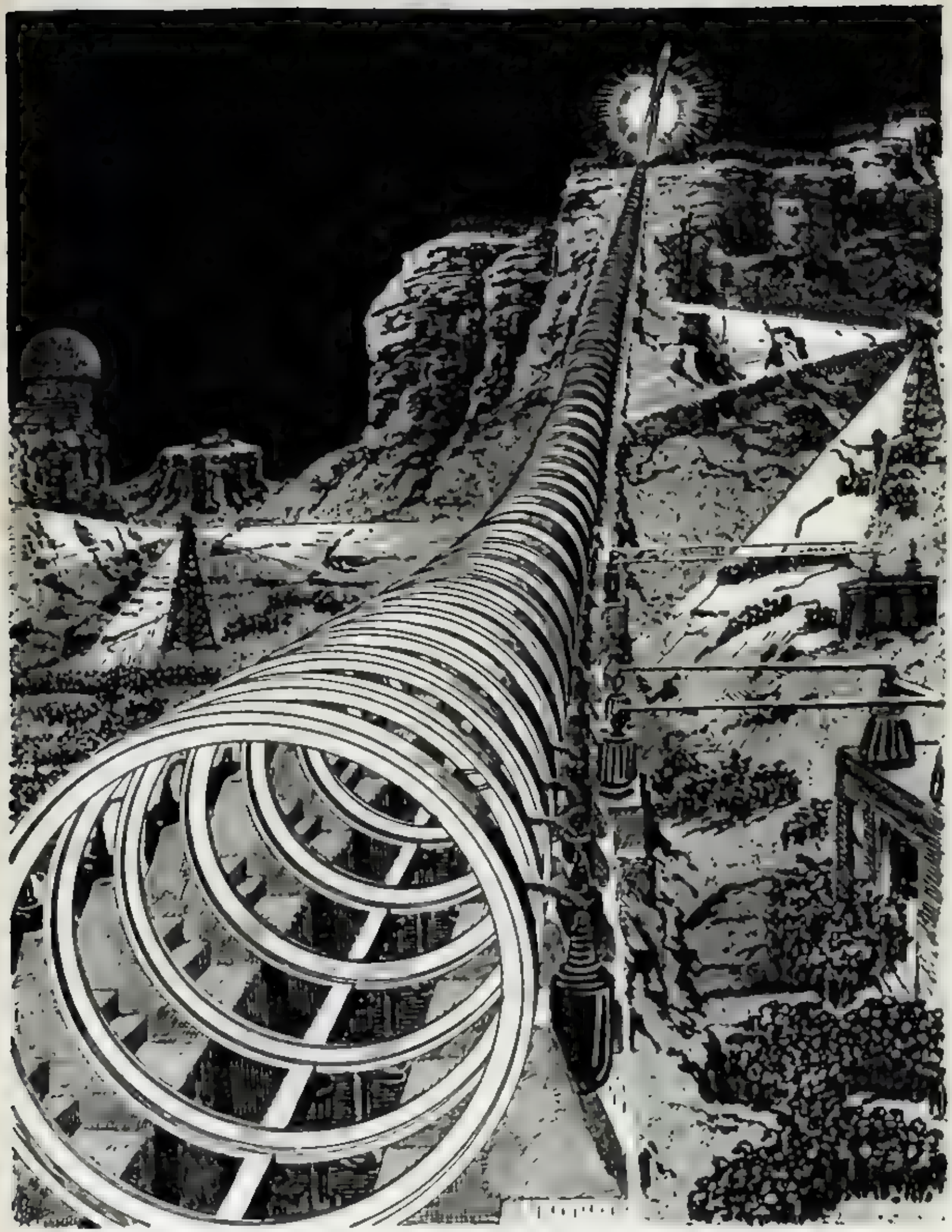


Illustration by Paul.

The "Astronaut" increased its speed through the gun up the curve and out of the cement muzzle. For an instant the powerful searchlight on the tail of the rocket was seen rising higher in the sky and disappearing in the west.

lowing the discovery of the western hemisphere, Europe emerged into a greater intellectual era, out of which grew our present civilization.

"But great as has been our development, we are still in the dark ages as compared with the new era just ahead of us. The discovery of a new world would mean more to us today than the discovery of a new hemisphere meant to Europe in 1492. If you look at the sky on a clear night, you will see that the universe is full of worlds to be discovered. All we need is a new Christopher Columbus—a man of that confident, fearless and adventurous type, who is not afraid to venture into the unknown.

"The Columbus of the twentieth century has arrived. He is now begging for ships and begging for men from the highest sovereign power of the earth—The Human Intellect! Let me read his plea as it now appears in the current issue of *The American Scientist*:

"'A Challenge to the Scientific World.

"'Our race has long boasted of its progress and achievements, the greatness of which can not be denied. Because of our supremacy over all other forms of life and our conquest of the forces of nature, we have been called the Masters of the World.

"'But are we the masters of the earth or merely her temporary and compulsory tenants? Is our race doomed to remain on this planet forever, when there are others in our own solar system and thousands, probably millions in our universe, many of which are capable of supporting life? For ages the challenge has been flung at us and for ages it has passed unnoticed. Is there a man living today who can look at the stars without feeling an urge to answer this challenge? Has the time come when we can solve the problem? Or shall our generation pass it on to our children to solve?

"'Man has answered the challenge of the sea, the air and even the frozen poles of the earth, and conquered. Has not the time arrived for us to accept the challenge of space and first the nearest heavenly body—the moon? The writer of this article proposes a voyage to the moon as our first attempt at space-flying.

"'A bank account of enormous proportions is ready to finance the expedition to the limit. There is but one thing that delays preparation—the lack of scientific plans for making a space ship. These plans can come from only one source—the human intellect. A prize of one million dollars is offered for such a plan.

"'This prize will be paid for the best plan for a rocket, projectile, sphere or any kind of a ship of space capable of making a voyage to the moon, moving about at will over the surface of that body, making a landing when desired and returning to the earth in safety to its passengers.

"'Any means may be used for propelling and controlling the space ship; but the merits must be tested and proven before the prize money will be paid.

"'If a new idea, hitherto unknown to science, is submitted, this offer will not interfere with the inventor's right to patent it and market it elsewhere. This offer is made for the privilege only of using it, and no further rights are expected.

"'A liberal reward is also offered for any idea that may be utilized in a space-flyer, which will add to its safety or serve as a means of propulsion, even though no complete plan is submitted.

"'Capital will be provided for experiments and the development of any plan that appears promising; but such experiments must be made under my supervision or at the expense of the inventor.

"'Last of all, the inventor must have confidence enough in his plan and its safety to be one of the passengers on the first voyage.

"'All plans must be submitted to Box 67, *The American Scientist*.'

Haverfield Enters

"NOW," continued Dr. Haverfield, "here is a chance for someone to become a millionaire and do a great service to humanity at the same time. It has long been the dream and ambition of man to send a rocket to the moon; but it has never been attempted. Writers of fiction have developed many interesting plans for interplanetary travel and they alone have succeeded. As usual, those fellows never get very far ahead of the actual fact. Strange and fantastic as their fiction may seem, the old saying that 'truth is stranger than fiction,' still holds true. The things yet to be developed by modern science are stranger and greater than human imagination has yet pictured. The submarine of Jules Verne was less than half a century ahead of the actual invention. To say that the time has arrived when his voyage to the moon is to be accomplished, may sound like the statement of a dreamer or harebrained fanatic; but such is far from being the truth. The next decade will prove it; the writer of the advertisement that I have just read will probably be successful, for the greatest handicap, the lack of funds, is removed. I always believed that, if Wall Street could be convinced that Tycho* was a mountain of gold, capital would be provided and the problem of interplanetary travel would be solved in a hurry. This modern Columbus seems to have the necessary funds and his offer will attract the scientific minds of the world.

"Since fiction writers have probably given the matter more thought than any other group of people, let us look at some of the devices they have proposed:

"Edgar Allen Poe was the first modern writer to accomplish this feat. His device was a balloon filled with a light gas; but not even Poe himself considered it practical for one minute. Jules Verne used a projectile, shot from a huge gun, planted several hundred feet deep in the earth. The explosion of gunpowder gave the projectile an initial velocity, capable of carrying it to the moon. Strange to say, the passengers were unharmed by the explosion and were still safe and sound after the projectile had gone entirely around the moon and fallen into the Pacific Ocean. It sounds very practical; but you may use your own judgment about trying it.

"Since Jules Verne, many other writers have told of lunar expeditions. Some have used atomic power, others light-pressure; some use radium, but the majority prefer to use gravity control. Let us consider these one at a time:

*Name of a lunar mountain.

"Atomic power is yet to be developed, but when it is its uses will be greater than that of electricity. But I have my doubts if it can be done in time to win this prize. We have never yet demonstrated to my complete satisfaction that light-pressure really exists. Manifestations attributed to it may be due to something else. Arguments in its favor are no stronger than those against it. Radium is too scarce, even if we know how to use it for space-flying. Gravity control is like perpetual motion; just a pleasant dream, impossible at present. Future generations will no doubt learn how to control gravity, but at present no one knows just what gravity is; so there is nothing tangible to work on.

"By far the most reasonable plans yet proposed are the rockets designed by such men as Dr. Goddard of Clark University, Fritz Van Opel, Max Valier and Hermann Oberth of Germany. I make no secret of the fact that I intend to experiment on a rocket myself and submit a plan for a space-flyer. It would please me if every student of Belmont would give this voyage to the moon some serious consideration and work out a plan for a space-flyer. Use any force that suggests itself, and you may succeed in giving mankind the greatest gift of the twentieth century."

After this amazing lecture, Lacey seemed to be a different man. He was no longer sociable and I felt that I had overstayed my welcome. Although he denied having any plan for a space-flyer, I was much inclined to doubt his word.

When I returned to Cleveland, I reported Dr. Haverfield's lecture to the editor. He did not see any news value in it; but asked me to keep an eye on Belmont University and report anything that looked like news.

CHAPTER II

A Meeting of Adventurers

IT was not until January, 1943, that I heard anything more about the proposed voyage to the moon. In a letter from Lacey, he said he was expecting an engineer from Chicago to investigate his plans for a ship of space. When I showed this letter to the editor, he asked me to go to Belmont and come back with a story. He promised to take the matter up with the Universal News Syndicate, controlled by the owners of the *Herald*, who would probably offer financial assistance for exclusive rights to publish news of their progress and permit a reporter on the trip to the moon.

When I arrived at Belmont, I told Cy Lacey of the offer I was authorized to make. He said I could take the matter up with the engineers at a meeting to be held at the university; where his plan was to be considered together with one submitted by Dr. Haverfield.

At the meeting, Cy and I were the last to arrive. Dr. Haverfield seemed to be the presiding genius, as he gave us an introduction to the others who were seated around a long table. Messrs. W. O. Mitchell and George Herrick, of the engineering firm of Mitchell and Herrick of Chicago, were introduced first. A young lady, whom I thought a secretary or stenographer in the employ of Mitchell and Herrick, was introduced as Miss Dorothy Brewster. Mr. Lester Winters, a chemist from St. Louis, who also had submitted an excellent idea, was introduced next. After Cyrus Lacey had been given a chance to show his dignity, the intruder was asked to introduce himself.

"I am George L. Davis, a reporter for the *Cleveland Herald* and a personal friend of Mr. Lacey. I am here at his invitation; but if you have any fears that I will publish anything against your will, I will gladly retire. But before I go, I have a proposition to make. My paper offers financial assistance for exclusive rights to obtain and publish news of your progress and to send a man along on the voyage."

"My friend," said Mitchell, "I fear we must ask you to retire. You may tell your editor that our capital is quite adequate. Furthermore, we do not desire any publicity."

"If you fear that my friend will tell his paper anything against your will," Lacey interrupted, "you may set your mind at rest. If he promises to return with no story, he will do so. I know the man better than you do."

"That may be true, Mr. Lacey, but I too know something about reporters. Nothing interferes with their loyalty to their paper."

Miss Brewster, who was sitting between Mitchell and Herrick, had up to this time been silent. She now surprised us by rising to her feet and settling the important question at hand.

"Mr. Mitchell, it is my request that the reporter be permitted to remain."

"But, Miss Brewster, I was thinking only of your interests when I asked him to retire."

"I thank you for that, Mr. Mitchell, but lack of publicity was my father's greatest mistake. If he had not worked in secret, he would not now be resting in an unknown grave and our position would be different. However, I have a word to say to the reporter, and this holds good for the rest of you, too. Not a word of our progress is to be given to the public, without my permission. I want to censor every statement that is given to the press. It would be a great relief to me to know that there is but one reporter on the job."

"I thank you, Miss Brewster," I replied: "You will have the opportunity to censor all my stories, if I am permitted to remain."

"Since it has been decided that Mr. Davis is to remain, we shall proceed with our business," continued Mitchell: "First, I would like to ask if you have ever given much serious consideration to the telescope with a lens one hundred feet in diameter, which was reported in several of the scientific magazines last summer. Dr. Haverfield, what did you think of it?"

"I considered it a crude sort of a hoax when I read it. An attempt to repeat the excitement caused by the 'Moon Hoax,' over a century ago. But, fortunately, the modern public is not quite so gullible. It has all the characteristics of modern fiction; the inventor works in secret, which is absurd in the twentieth century. The casting and cooling of such a lens is another absurdity. Furthermore, as atmospheric interference increases with the size of the lens, with one of that size, it would be looking through a thick fog, through which the light from a star could never penetrate. And to make the

fictitious element of it more perfect, a fire fortunately broke out when no one was looking and destroyed all the evidence before the claims of the inventor could be verified."

She Describes the Moon

A SMILE broke out, which soon developed into a hearty laugh. Dr. Haverfield had made a hit and was very proud of it. But it was not appreciated by all. Mitchell and Herrick were not laughing, neither was Miss Brewster. Her eyes snapped like lightning, her fists clenched and as she rose to her feet angrily:

"It may surprise you to know that this telescope was and will again be a reality. It was far from being a hoax for two reasons: First, it really did exist and I have the proof of it with me here. Second, no hoax is complete without an attempt to force it upon the public. The attempt was lacking. The authors of these articles in the magazines drew upon their imagination for most of the details and I neither authorized nor sanctioned the stories. No one can blame Dr. Haverfield for his opinion; because thousands of others share it with him.

"The telescope was designed by my father, William A. Brewster, who built it with the assistance of a score of expert lens makers from Paris. My friend here, Mr. Mitchell, designed and installed the machinery for moving and controlling the lens. Of course, there were hundreds of laborers; but they never knew the real purpose of the work.

"Furthermore, despite what Dr. Haverfield says, the fire did not destroy all of the evidence. The eyepieces only were destroyed, and they are now being duplicated by their original makers in Paris. Mr. Mitchell and his assistants have repaired the damage done to the machinery and, as soon as the new eyepieces arrive, the observatory will again be as good as ever.

"But it is not the purpose of this meeting to boast of my father. We have a task of our own to accomplish. I must describe conditions on the surface of that so-called dead world, as they were revealed to me through the big telescope. Present-day scientists are very much mistaken as to the moon; and I have found many errors in their so-called established facts. First of all, the moon does have an atmosphere, denser and heavier than our own, although it does not contain the same elements. It contains an unknown gas, which is both heavy and invisible, as well as oxygen, or something very similar to it. But it is entirely lacking in hydrogen and water vapor, which makes our atmosphere visible. The lunar atmosphere is entirely invisible and astronomers can not be blamed for thinking that the moon floats in a perfect vacuum when they look at it with their smaller telescopes.

"Water is not lacking, but it is very scarce. At the base of some of the lunar mountains, I have found small springs which flow for a short distance, only to soak into the ground again and return to the underground pool from which they came. No evidence of evaporation is found and I am inclined to think it is impossible for water vapor to mix with that invisible atmosphere.

"Vegetation is always to be found near these springs and of course animal life. This vegetation is not green, like our own well-watered grass, but is of a brown sun-scorched hue. It appears in the form of grasses, vines and small trees, resembling the scrub pines of Greenland and the cactuses of Arizona and Mexico.

"Animal life of the strangest forms live here too. Australian animals look strange to the native of North America, and those of the deep sea are stranger still; but lunar animals are even more peculiar. Bipeds are more common than quadrupeds; instead of describing them, I shall show you some pictures I took with the aid of the telescope."

Opening a brief-case, she withdrew several photographs and handed them first to Dr. Haverfield, who examined them one at a time and handed them to the rest of us.

"Of all things! The five-toed eohippus! And he is walking on two feet, too. How remarkable! And what is this? He looks like a black-skinned turkey as nude as if he had just escaped from a meat market! Ha! Ha! Here is the funniest freak of all, Miss Brewster, what do you call this fellow?"

"I have given him the name of *Selenitus Latipedatus*, she answered.

"Ha! Ha! Look here, Lacey: the 'Flat-footed Selenite'!"

Lacey's loud laugh aroused my curiosity, but the picture aroused my sense of humor. Here was a hairless, apelike creature, lying flat on his back with his feet raised high in the air. His feet were actually so large and wide that he was using them for an umbrella to protect his body from the sunlight. The next picture showed the same fellow walking on his hands or front feet, with his wide umbrella-like feet above him. But the real laugh came in the next picture, where he was flying through the air, using his feet as gliders, reminding me of a movie I had once seen of the Thief of Bagdad riding a magic carpet.

After Dr. Haverfield had remarked on the adaptability of such creatures to lunar conditions, low gravity, long, hot days and long, cold nights, he asked Miss Brewster if she had ever seen any evidence of human beings or of a civilization.

I thought I saw a faint blush come to her cheeks as she answered: "I have pictures here of the ruins of old stone buildings, evidence of a vanished civilization. But as for men; do you imagine that Nature, working under lunar conditions, with lunar elements, would duplicate the same process of evolution which she used on our world to produce our race? Do you think a human being is adapted to lunar conditions? No terrestrial animal is found on the moon; why do you expect to find men there?"

"The human race is adaptable to any condition that approximate those found on earth," replied Haverfield. "As for animals, what about the five-toed eohippus and this fowl that is evidently related to the turkey?"

"That is a mystery that we may hope to solve when we get to the moon."

CHAPTER III

The Challenge Is Answered

THE discussion continued until late in the night; when the meeting was adjourned until the following morning. For the first two hours of the second session, Miss Brewster did most of the talking. As I was prohibited from taking notes, I do not remember everything she said. Furthermore, I was not very highly interested in technical discussions, and paid more attention to her blond, wavy hair, sparkling blue eyes and small, beautiful face, which could not but reveal her sparkling intelligence. Her graceful and perfect form and rare beauty merited a comparison with Venus, the goddess of beauty; while the ease and familiarity with which she discussed obscure subjects, made me think of her as a personification of Minerva, the goddess of wisdom.

By the time she had finished talking, I knew that I had met the perfect woman. The symptoms were not hard to recognize; I was in love with her. But to win a girl so much superior to myself was another problem. From the start, I felt that my love was hopeless. Her scientific education and unusual intelligence was a barrier that a common person like myself could not surmount. It made me feel like a mud turtle in love with a bird of paradise.

Her description of the lunar landscape, a rocky, barren desert surface, which with the exception of a few oases, covered the entire surface of the moon, was very realistic. She also told of the hot sultry days and cold nights, each two weeks long, during which it would be almost impossible to live without some artificial protection. But her convincing proof of the density of the atmosphere, so heavy that smoke rose rapidly for miles before it was dissolved, showed plainly that human beings could endure it with no ill effects.

"Four-fifths of the moon's visible hemisphere is incapable of supporting life," she continued. "We must have a means of travel after we get there. The rocky surface prohibits the use of an automobile or motorcycle. Horses and camels could not endure the scarcity of water and the lunar animals would probably prove undomesticable; so we must travel through the air. None of you knew that the moon had an atmosphere, so it is not strange that your plans did not include a safe means of travel.

"Over two hundred plans were submitted, not one of which was perfect, but we think that by combining three of them, a space-flyer can be made. We will now consider the three best plans and tomorrow we shall start designing the first ship of space in the history of the world. One hundred and fifty-two of the plans were for a Goddard rocket. We did not select Dr. Haverfield's plan because it was superior to all others; for it was almost identical with several. But we did think that his mature years, wide experience, marvelous education and standing among the leading educators and men of science throughout the nation, made him the proper type of man to have as captain of our expedition. I will ask him to read his own plan and answer the questions we shall fire at him."

With these words she sat down and nodded to Haverfield. He arose nervously and removed a bulky manuscript from his brief-case. "My friends," he began. "I can claim no originality for a project based on the work of that great scientist, Dr. Goddard. It was my desire to help solve the greatest problem of the age and to aid in answering the challenge of the skies, that prompted me to give the rocket-recoil propulsive idea an exhaustive study. I was not attracted by any hopes of winning the million; but the size of the prize did convince me that someone was in earnest and astronautics was about to become a reality.

"To begin with, Dr. Goddard's original idea was to send to the moon one kilogram of a magnesium compound, whose brilliant explosion would be seen from the earth. He found it would be necessary to use six hundred kilograms of rocket powder to develop the required energy to overcome the resistance of terrestrial gravity.

"To send a heavy rocket to the moon, carrying human passengers, food supplies, scientific instruments, fuel for the return trip, etc., weighing several tons, one must carry six hundred times the weight of the rocket in fuel. On the face of the proposition, this sounds impossible, but here is another established fact:

"Given a correct scientific principle, capital enough to make use of it, the result is certain. Dr. Goddard provided the correct scientific, mechanical principle; you have said that your capital is adequate, so the success of the venture depends entirely upon the combined intellect of the group here assembled. We have an experienced and successful firm of engineers, a capable and energetic chemist, a young student who will soon be a mechanical engineer, a young lady whose knowledge of the world to which we are going is at least half a century in advance to that of any other scientist of the earth. To say nothing of an elderly professor, whose ability is eclipsed by his efforts and desire to help.

"We have now a rocket fuel produced by a French scientist, which consists of a detonating mixture of oxygen and hydrogen. Another has been developed of far greater power, atomic hydrogen in its activated state; but, unless we learn to control these ourselves, they can not be used for our purpose. I have a plan for a rocket, using a slow-burning rocket powder and small discharges of nitro-glycerine and T. N. T. This may sound fantastic, but I can remember the day when the idea of using an explosion of the mixture of air and gasoline vapor for the purpose of driving pleasure cars was also considered fantastic."

Lacey's Plan

DURING the next two hours, Dr. Haverfield described his enormous rocket, a huge aluminum shell with burners for explosives arranged on all sides for the purpose of steering it and retarding its speed after it had entered the field of lunar gravitational attraction, and bringing the speed down to zero when making a landing.

"In view of the danger of colliding with meteors," he continued, "I do not recommend the use of glass windows, which may be broken and thus let the air inside the rocket escape. Periscopes may be arranged so the crew can have an unobstructed view in any direction.

"Before I learned that the moon had an atmosphere, I devised a means of travel. The rocket can rise to any desired lunar altitude and be kept there by explosions on the bottom. The low lunar gravity makes necessary only a small amount of fuel to support the weight of the rocket. Explosions on any side of the rocket will send it in any desired direction. This concludes my description of the rocket. You now ask your questions."

Cy Lacey was ready with the first: "When you leave the earth, how are you going to be sure that the rocket goes straight up in the sky, pointed at the moon? Will you employ a trough, such as small rockets use; or will you trust to luck and fate to send it in a straight path? You will remember that the rocket will act very quickly and, when near the earth or moon one must act in a fraction of a second to prevent a collision. I discarded the rocket principle in the beginning on that account."

"I am glad you mentioned the matter. I gave it considerable thought myself. If the rocket were pointed in the proper direction and rudders or finlike projections extended on all sides for its entire length, they would hold it to its course while passing through the air. Naturally, some attention must be paid to the burners at the rear end of the car to prevent the rocket from turning over, which would happen if the force were uneven or lopsided. Does that answer your question?"

"I do not know," Lacey answered. "I'd have to see some experiments before I could commit myself. My experiences with these 'Fourth of July' rockets have shown me that they cannot be aimed with any degree of accuracy, without a trough or something to take the place of the barrel of a gun, in order to start them right. I have my doubts if rudders would be satisfactory."

A hot, but good-natured, argument followed between the professor and the student. This seemed to be a common occurrence and a favorite pastime to both of them. Both were deserving of a comparison to the schoolmaster in "The Deserted Village;" "e'en though vanquished, he could argue still." But, if Dr. Haverfield did forget his dignity in the heat of an argument, he was always shrewd enough to avoid an argument unless some good was to come of it. It was one of his theories in pedagogy, that the best efforts are always obtained in a mental combat, and every student at Belmont had to learn how to argue convincingly. But Mitchell, who was unaccustomed to Belmont, used a little diplomacy and saved the day.

"Gentlemen, it is our intention to incorporate the best features of three plans; so if Mr. Lacey will cease annoying Dr. Haverfield and tell us about his plan, the question on the floor will be automatically settled."

"Very well," Lacey replied, "Like Dr. Haverfield's plan, mine is not entirely original. About sixty years ago, Jules Verne sent a fictitious projectile to the moon. He built a huge gun in the earth and fired a quantity of gunpowder, capable of sending his projectile to the moon. My plan calls for a projectile, shot from a big gun."

"Cyrus Lacey! I am ashamed of you. You are a disgrace to Belmont! Don't you know that the discharge of the gun would blow the projectile to atoms?"

"But, Dr. Haverfield, Belmont is not disgraced. As president of this great university, you should feel proud of your student. I have no intentions of using gunpowder, neither shall I use dynamite, nitro-glycerine or T. N. T. I have other means of propulsion."

"I should hope so! What means of propulsion do you have up your sleeve?"

"Electrical energy. Do you know that a modern power plant produces enough energy every hour to send a projectile weighing fifty tons to the moon!"

"I will have to take your word for it; but how are you going to utilize it?"

"By the simplest means possible—electromagnets in a magnetic gun. The principle is that the space car on a track will be magnetized and attracted to and repulsed by a series of magnets.

"Let us place some magnets in a straight line. The steel object will be a miniature space-flyer. We will give each magnet a maximum of current and, if there are enough magnets, the projectile will reach a speed far beyond the power of the mind to appreciate.

"Let us arrange the magnets so that the projectile is drawn to them, but when it reaches them, the current will be reversed. What is the result? After the projectile passes it, the magnet becomes repulsive and we have double the power with the same number of magnets. This, in miniature, describes my electromagnetic gun."

"How many magnets will you use?" asked Dr. Haverfield.

"That will depend upon various factors: The weight of the projectile, the current available, the speed required and the attractive and repulsive power of the magnets. I did not have the data required, so I submit no figures."

"Have you considered the cost of such a gun?" asked Dr. Haverfield who absent-mindedly forgot that there were strangers present and he was not presiding over a physics class.

"I assumed that any company who could offer one million dollars for the idea could finance anything. Was I correct, Mr. Mitchell?"

"Our capital is quite adequate to finance the building of such a gun."

"Did you intend to dig a hole in the earth in which to build the gun? Or did you expect to build it a mile high and let it fall over before it could be used?" continued the learned doctor.

"Neither. I proposed using the slope of a mountain side. The rocket will not need to be pointed toward the zenith; it can be started gently from a position of rest, by a railroad engine, along a level plane until it reaches the first magnet. These magnets will gently curve up the side of the mountain until they reach the proper angle. The projectile will now travel for half a mile or more in a straight line until it leaves the muzzle of the gun. The last magnets can now be placed farther apart, as the projectile will have an enormous speed."

"I am sadly afraid, Mr. Lacey, that your idea is

not only worthless but dangerous," said Dr. Haverfield. "In order to reverse the current and make the magnets repulsive, the projectile must itself be magnetized. If this is done the projectile will attract every meteor within miles of its course. Meteors, you know, are composed largely of iron."

"Anyway let us submit it to a laboratory test before it is condemned. But it need not be magnetized permanently," answered Lacey. "I think I have a remedy, however. The projectile can be magnetized by electric current, supplied by a contact with the sides of the gun. When it leaves the gun and enters free space there will be no further contact and the magnetism will leave it."

Still undaunted, Dr. Haverfield continued his offensive: "Your method of leaving the earth is not so bad, but how do you expect to steer your projectile? How do you intend to make a safe landing? And, how will you travel over the surface of the moon, once you get there?"

"Oh, that is simple enough," Lacey replied. "We will use my gun to give us an initial velocity, after that we can use the principle of the Goddard Rocket."

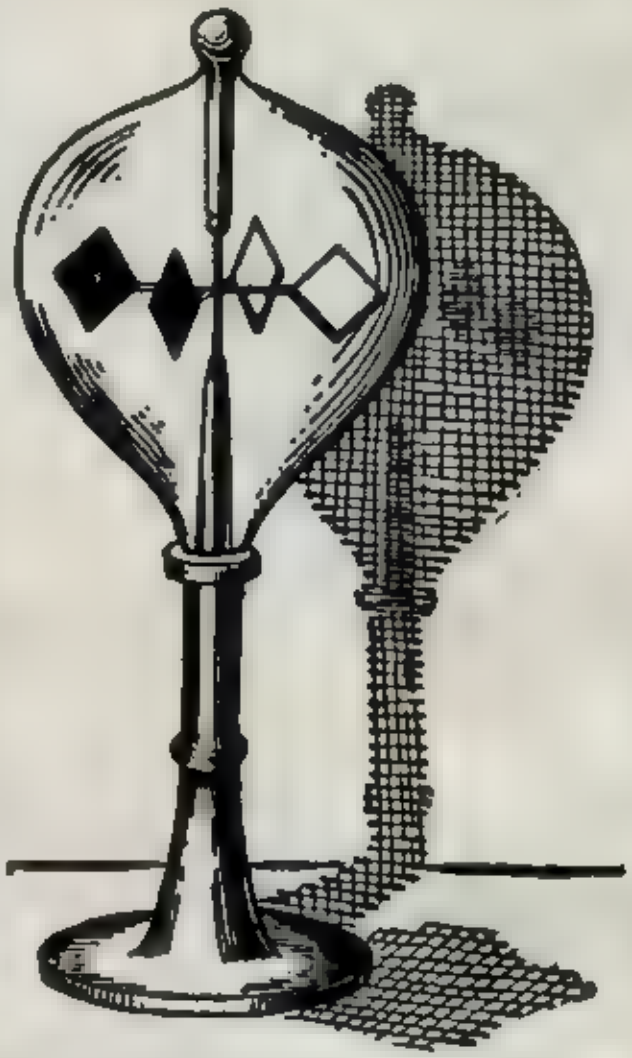
CHAPTER IV
Absolute Black

"MR. LACEY'S electromagnetic gun was quite a surprise to all of us, but there is a bigger surprise coming," Mr. Mitchell said, as Lacey took his seat, "Mr. Lester Winters has by far the most powerful and cheapest means of propulsion. So far as I know, his force is the only force that as yet has ever spanned that void that we hope to conquer. After we have heard from him, we will begin making our plans for the real space flyer. Mr. Winters."

Winters was a tall handsome man, about thirty-five years old, with light hair and blue eyes, a perfect Nordic type. He was dignified and pleasing and his figure made one think of him as a professional athlete, rather than a chemist. As he told of his recent discovery, he received the undivided attention of his audience. It seemed more like a lecture than a class-room discussion, such as Lacey and Dr. Haverfield had staged.

"This is not a plan for a ship of space," he began: "Nor do I have any hopes of winning any prize. I am merely offering the use of a recent discovery of mine. As I am a chemist and not a mechanical engineer, you will have to design your own space-flyer. As Mr. Mitchell said, mine is the cheapest and most powerful means of propulsion yet discovered. And as yet, it is the only force that has propelled anything from one body in space to another.

"To describe it, I will first call your attention to a small device with which you are all familiar—the radiometer. As you know, it consists of a glass bulb from which the air has been exhausted, enclosing two arms of aluminum. These cross each other at right angles and carry a mica vane, one side of which is black while the other is bright. These arms are fastened horizontally to a vertical shaft which can rotate with them. When subjected to sunlight, these vanes set up a rotation, due to the greater reaction of light and radiant heat upon a black surface than upon the bright. Black absorbs light and heat, while white reflects both and absorbs neither. The blacker the object, the more light and heat absorbed.



The radiometer. By means of the difference of pressure on the black and white surfaces of the vanes, when the sun shines on it, the vanes revolve

"In my researches for the Morrison Paint Company, I was successful in my search for a pigment that would produce a blacker shade of black than any previously known. It would seem impossible to get anything blacker than my product, which I have named 'Absolute Black.' Lampblack is a dull gray, compared with absolute black, which absorbs every particle of light and heat that reaches it, reflecting none. Even under the condensed rays of sunlight, from the largest lens available, no light is reflected and the color remains black—black to the Nth degree.

"This color is undesirable for paint, as it makes an object too hard to see. It is not invisible, except when in front of a background of the same color. Inside a room whose walls are painted absolute black, every object painted with that color is invisible. There are no reflected high-lights, no darker shadows and no contrast; everything is black and invisible.

"No one has yet determined absolutely whether light is a vibration of the ether or a bombardment of atomic or electronic particles of matter or energy emanating in all directions from its source. If the latter is true, the particles of light thrown against an object incapable of reflecting any of them exert a tremendous pressure. If the former theory is correct, absolute black picks up from the sunlight another ray, which for want of a better name, we can call the Ray of Propulsion. But regardless of whether we call it the ray of propulsion or light pressure, a vibration or a bombardment, radiant heat, energy or light, the effect is the same and the force is enormous.

"But it varies; it depends upon the intensity of the light. In sunlight, the pressure varies from three to twenty pounds per square inch, depending upon the atmospheric conditions and the amount of sunlight received. Outside the earth's atmosphere, this would be greater, but no one can say just what it would be.

"By painting the vanes of the radiometer with absolute black instead of lampblack, their speed would be increased to that of light itself, if the cen-

trifugal force did not first cause them to fly to pieces. I have built a radiometer motor and applied for a patent; and I think absolute black will aid in solving the problem of interplanetary travel.

"It is a power of propulsion only while traveling away from the sun. It would be handy in going to Mars, Jupiter or any planet outside the orbit of the earth, but useless for the return trip. When the moon is full, it would carry a space-flyer to the moon, if one could be launched into outer space by some means such as Mr. Lacey's magnetic gun; and the return trip could be made at new moon. Both voyages would be made directly away from the sun.

"As for moving over the surface of the moon, I was able to offer no plans until I just learned from Miss Brewster that the moon has an atmosphere. Now I can suggest the gasoline-motored airplane. The low gravity will eliminate the necessity of a larger wing surface or great amount of fuel. With my practical knowledge of aviation, I believe I am safe in saying that two tiny MOTH airplanes will solve that phase of the voyage; but taking fuel with us is another difficult problem.

"I can offer no plans for a space ship, no means of making a safe landing either on the moon or the earth; but if you do succeed in making the proposed astronautical vehicle from the ideas already submitted, I want to be a passenger if you will let me work to pay for my fare. In order to help solve this problem, I offer the use of absolute black to you at no cost, but, even if I knew that this trip would be fatal to all passengers, I'd want to go just the same. The thrill of being one of the first to have a vision of the earth from outer space is well worth risking the remainder of one's life."

The "Looneynuts"

DURING the days that followed, plans, drawings, calculations and models were made and tested, either to be approved or discarded. It was finally decided to build a Goddard rocket of steel, making it as small and light as possible. It was to be launched into space by an electromagnetic gun, such as Lacey proposed. It was hoped that the large initial velocity, together with the ray of propulsion and possibly a few explosions to send the rocket into that zone where the lunar gravitation was stronger than the terrestrial, would enable it to reach the moon. Explosions would then be used to decelerate the speed and bring it down to zero when making a landing.

For some mysterious reason, Miss Brewster was very careful about letting certain information reach the public. She prohibited my telling about any of her discoveries of lunar conditions, such as the presence of an atmosphere, lunar life and water. In describing the ship, nothing could be said that would indicate the facts revealed by her huge telescope. The only reason she gave for this partial secrecy was that all the scientists of the country wanted to dispute her and argue with her; and she did not care to discuss it with them, since she did not have her telescope ready to back up her claims. As a matter of form, she accepted a nominal sum from the Universal News Syndicate for exclusive rights of publication, on the condition that I was to be the only reporter assigned to the story.

This was a great thing for me. I was no longer a cub reporter, but a world-famous journalist. I do not claim that this was due to any particular ability of my own, but to the story that I had to tell. Astronautics were beginning to attract attention throughout the world, and my censored stories were published in every paper owned and served by the syndicate.

Rival papers resented this unfair treatment as they called it and lost no opportunity to take a rap at the *Astronaut*, as our vehicle was named. "The word *'Astronaut'* means navigation between the stars," one paper pointed out. "This contraption expects to go only to the moon. A more appropriate name would be the 'Lunanaut' and its builders should be called the 'Looneynuts'." This brought much applause from certain types of readers.

Because of the elimination of vital parts in my censored stories, the public and even the greatest astronomers in the country did not know that a lunar atmosphere existed. They could not be blamed for thinking we were crazy. It was rumored that it was all a publicity scheme of some kind, but as the work continued without interruption, the mystery deepened. A theory was advanced that Miss Brewster was spending a lot of money in order to get a screen contract; but that was disproved when she turned down offers that would make most women think they had reached the height of success.

Rival papers called several great scientists to their aid and many were the authoritative statements made about our plans and ambitions that seemed to justify the name of "Astronuts," the name by which we were called on the stage, in the street and in the humorous magazines. I begged in vain for permission to combat them and tell of Miss Brewster's discoveries. She said that all great men who ever added much to the knowledge of the world, had tried to argue with their scoffers. The only argument that could convince them was actual results. Dr. Haverfield begged for permission to get into the argument; he enjoyed an argument better than an Irishman enjoys a fight. He was as uncomfortable as a dog wearing a muzzle among a pack of wolves.

Nonsensical ridicule had absolutely no effect upon Miss Brewster. She thought our engineers were competent enough to know what they were doing, and the views of people of lesser importance did not interest her. But she compromised with Dr. Haverfield. He was permitted to write articles that succeeded only in arousing the fighting instincts of his opponents; since the vital parts of his articles were censored. This was just what Miss Brewster wanted, because she could get the views of other learned men, which given in the heat of an argument, represented their best efforts. It was through this source that much valuable information was obtained and several mistakes were avoided that had been contemplated by the "Astronuts."

CHAPTER V

The "Astronaut"

BY the time the term ended at Belmont, the plans were all complete. Dr. Haverfield had resigned his position as President of the University and was given the dignified title of President

Emeritus; as he had concluded the thirty-second year as head of the college he had practically built. Lacey was graduated with an M. E. degree. Winters, Herrick and Dr. Haverfield began work on the *Astronaut*, while Lacey and Mitchell, with hundreds of helpers, began work on the electromagnetic gun in the mountains of Arizona, near the town of Brewster.

In order to hurry the job along, as many men were employed as could be used. The magnets were easier to build than anyone had imagined; and with unlimited capital and an abundance of labor it was not very difficult to build the cement gun, which held the magnets in place. An ideal location was found along the mountainside, where it was possible to point the gun at the proper angle that would send it to the point in the moon's orbit, where the moon was calculated to be when the *Astronaut* should land. The action of the magnets on all sides of the gun caused it to be suspended in the center, producing no friction as the *Astronaut* passed through at an ever-increasing speed. Two small grooves were made on opposite sides of the gun, through which winglike projections, extending the full length of the rocket, were intended to slide. These would give the opposite effect from that received by a bullet from the spiral rifling of a gun-barrel, and prevent the *Astronaut* from whirling as it traveled through space.

When the magnetic gun was first planned, it was first necessary to set the date for the start of the journey and compute the time to the exact second, in order to aim the *Astronaut* toward the proper point in the skies. After a careful study of the moon's motion, the time of the departure was set for June 27, 1945, at about 9:30 p. m. But the gun and the rocket were both built before the specified times, and wires were strung to six of the greatest power plants in the west. Their combined capacity, converted into direct current, was needed to give the magnets the required power. When the gun was used, the cities served by these power companies were in darkness for several minutes.

As a test, a projectile was made of the same size and shape as the *Astronaut*, and filled with sand until it had the same weight. When it left the muzzle of the gun, headed for empty space, its velocity was estimated at eighty-three miles per minute; quite enough for the *Astronaut*, considering that other means of propulsion were available later. At a local observatory we watched it until it disappeared far beyond the earth's atmosphere, probably to explode in space or be crushed by a meteorite.

If the magnetic gun was a notable achievement of modern engineering, the *Astronaut* was nothing less than a masterpiece. As it lay on a railroad flat-car, waiting to start its extraordinary voyage, it presented a very flashy appearance. Its steel sides were painted a bright scarlet, with portholes, periscopes and explosion chambers, which covered the rocket on all sides, trimmed in blue. The rudders at the rear end, as well as the narrow finlike wings which ran the entire length of the car, were yellow. This combination of colors, while not appealing to the aesthetic senses, made the rocket easier to locate by the many telescopes that would try to follow its flight. A powerful searchlight at the tail would make it still easier to be seen.

In shape, it resembled a long artillery shell or rifle cartridge, about the size of a modern railway coach. Its nose came down to a point, in order to resist the friction of the atmosphere, while the rear presented a flat surface, covered with explosion chambers. The thousands of people who looked at it never suspected that two powerful, but tiny airplanes were dismantled and concealed inside the *Astronaut*. The airplanes, as well as the lunar atmosphere, had been kept secret.

The *Astronaut* was equipped with everything an up-to-date space-flyer needs. The room in the front end of the car was thickly padded. Luxurious padded chairs were arranged for each of the five passengers—Miss Brewster, Dr. Haverfield, Lacey, Winters and myself. These chairs could also serve as beds and, judging from the many springs, air cushions and padded upholstering, one would think it impossible to experience a shock of any kind in them.

The adjoining room was intended to serve as a kitchenette and storeroom for food supplies. Miss Brewster had volunteered to see that we did not get hungry at any time during the voyage. Judging from the boxes, barrels and other containers, fastened to the walls, she had overdone her duty. Dr. Haverfield protested against such a large supply, but she had her own way.

"In case things do not go exactly as planned," she said, "and we are not able to make the return trip as soon as expected, you will thank me for bringing these extra barrels of corned beef and bags of beans and rice."

The third room contained the controls for the explosives, the observation windows and periscopes which would give an unobstructed view in any direction. Here were also located the double portholes for throwing out refuse, the oxygen tanks, storage batteries for furnishing current for lights, fans, stoves and heaters and ignition for the explosives. The rear half of the rocket was filled with gasoline to be used as airplane fuel and the other explosives for the rocket, which was estimated to be enough for the entire trip.

Everything was securely fastened to the walls to prevent moving about when the speed of the rocket was being changed. The center of the *Astronaut*, for the entire length, was kept open and a ladder extended through this central passageway in order to enable one to climb from one end to the other.

The walls were made of three airtight thicknesses of steel, with a vacuum inside each section of the wall. Thus the passengers were enclosed within a double "thermos bottle"; a protection necessary against the intense cold of outer space, which was estimated at 459 degrees Fahrenheit below zero, as well as against the heat that would be generated by the rapid passage through the barrel of the gun and through the atmosphere. The windows and portholes, which were all double, were made of two layers of wire glass with a layer of celluloid between each layer. This reduced the danger of broken windows and escaping air to a minimum. As an additional protection while going through the gun and the earth's atmosphere, a metal cup-shaped covering was placed over the windows on the outside. The edges of these cover-

ings were made of rubber, the air was partly exhausted and this partial vacuum held the covers in place until the *Astronaut* had passed through the atmosphere. As the air pressure outside became weaker, that within the cup-shaped covering became great enough to force the covering off the window. In case a window was broken by a meteor or anything else, Lacey had devised a clever device by which the outrushing air would cause a covering to rise and cover the window from the inside.

Lester Winters had his black metal screens in readiness to place over the windows on the inside, when the proper time came to use them. We had no way of telling just what power we could expect, or what speed they would produce. But it was proved on paper that the ray of propulsion could carry us to our destination; while the explosives could be held in reserve for steering and braking purposes when we made a landing, as well as to give us a kick-off when we were ready to return to the earth.

Last Thoughts

WHEN everything was in readiness and we were waiting for the proper moment to start, our real worries began. To Dr. Haverfield, the most fearful thing was the lunar atmosphere. For thirty years he had believed and taught that the moon floated in a perfect vacuum, and he could not convince himself that he was wrong. Lacey worried about those black screens. He feared that they would be worthless and the initial velocity of his gun would fail to carry the *Astronaut* to the moon. Winters was afraid some accident would happen while going through the magnetic gun, and refused to be convinced of its safety. Miss Brewster feared that the explosives would not make a very good brake and the rocket would crash into the moon with such force that the rocket and all it contained would be instantly annihilated. Even if we did make a safe landing, she doubted if our knowledge of aviation would be sufficient for flying on a strange world, where the force of gravity was much different and no one knew anything about atmospheric conditions.

But I thought the real thing that was worrying them was the same thing that was worrying me, although I would not mention it—"cold feet." I thought they secretly wished they were following the example of Mitchell and Herrick, who decided to stay in the world where Nature had placed them. But there was something else that worried me, although I did not dare to mention it to anyone. What was going to happen if four men and one woman were stranded on a strange world? I loved Miss Brewster enough to give my life for her, but she had no love to return. Lacey and Winters were as much her devoted slaves as I. They too had probably found that their love was hopeless. As for Dr. Haverfield, one would imagine him immune to the charms of a young woman; but I actually believe he would have jumped through a hoop for her, if she asked it.

Four men in love with one woman, a quarter of a million miles away from civilization! How much time would it require to wash off the thin varnish of civilization and leave nothing but primitive passions? How long before we would fly at each other's throats and battle for the possession of the only woman on a strange world?

At last the big day arrived when we were to enter the *Astronaut* and leave Mother Earth and all the comforts of life behind, and trust to God and the *Astronaut* to carry us safely across that great void which no one had ever before attempted to span. Judging from the number of people to see us off, one would think that the entire population of the world was there in the valley and on the mountainside. Every race and nation on the globe was represented. Hundreds of policemen and National Guardsmen were necessary to preserve a semblance of order, and to prevent the mob from tearing the *Astronaut* to pieces and carrying it off as souvenirs.

During the intervening past weeks the public attitude had suffered a change and the cheers and absence of jeers proved that they were not so incredulous as they had been. Those who had been poking fun at the *Astronaut* for two years, were here now cheering the "Astronuts." Outwardly, they were hoping for the best, but it is doubtful if there was a soul present to whom the success of the venture was assured. As for myself, the music from every band in sight or hearing was necessary to keep up my spirits, and prevent my heart from freezing completely.

The zero hour had been set at nine hours, twenty-two minutes and ten seconds past noon, Mountain Standard time, on the 27th day of June, A.D. 1945. At that instant a locomotive would push the flat-car on which the *Astronaut* was resting toward the first magnet of the huge gun, giving it an initial speed of about fifty miles per hour before the magnets did their powerful duty. The gun was aimed with the greatest care, to make sure that the *Astronaut* would leave the earth at an angle of sixty-four degrees, at a westward velocity of more than 700 miles per hour to offset the motion of the earth on her axis in that latitude and a vertical velocity approximating 3600 miles per hour, or 60 miles per minute. Thus the actual velocity would be at least 61.9 miles per minute or 3715.6 miles per hour.

During the afternoon and evening preceding the zero hour, a ceremony took place, which included the christening of the *Astronaut* and prayers by a dozen leaders of various religious denominations. Speeches were made by famous orators and by the "Astronuts" themselves. Every word was broadcast by two networks of radio stations to all parts of the country. I was given the job of broadcasting our experiences inside the *Astronaut* as we started, and for as long as there was any possibility of being heard on the earth.

I shall not attempt to repeat all the eloquent oratory; but a short speech by Miss Brewster deserves a place in this manuscript. As she rose to the platform, the moon appeared above the eastern mountain tops. For several minutes she could not speak because of the cheers from the crowd, who now caught their first glimpse of the daring girl whose popularity and fame surpassed that of any member of her sex that the nation has ever produced.

"Fellow citizens of the earth," she began, "we are about to start on a voyage to our sister world, which is now rising above the distant mountain

tops, apparently unaware that she is about to receive visitors. It may surprise you to know that I firmly believe she is expecting us. Look at her closely. Can you not see the outlines of a human face? Do you see that smile of satisfaction and happiness she is wearing tonight? It is to be found nowhere else except in my heart. The moon and I have been friends for a quarter of a century; I have told her all my troubles, secrets, joys and sorrows since I was a child.

"When I looked at her through my father's giant telescope, she revealed her secrets, her troubles, joys and sorrows to me. I have held these secrets sacred and told but a few of them to that small group, whom you call the 'Astronuts.' After I have started for the moon, there will be no further need for secrecy. I have written these things for your benefit and Mr. Mitchell knows where they may be found. Within a few days the newspapers will give them to you, and you will know that our voyage is not quite as blind and foolish as it appears. As for my fellow voyagers, I am saving a surprise for them until we reach the moon.

"My many friends, I have enjoyed every minute of the twenty-six years I have spent on our world. Tonight I am leaving it, and I hope never to return. To start to the moon makes me very happy; but to leave the land of my birth makes me very sad. But my greatest regret is that my father could not have lived a few years longer, so that he could see the achievement of the greatest ambition of my life. And now I must tell you good-bye; and may God continue to protect you forever."

CHAPTER VI

From the Universal News Service

At this point, we interrupt the narrative of George L. Davis to insert a summary of several news items which appeared at the time the Astronaut *started to the moon.*

June 27 (1945) Extra Edition:—Tonight the *Astronaut* started on her maiden voyage, which may also be her last. A crowd estimated at over a million was assembled on the mountain sides and in the valleys near Brewster, Arizona, to see the start of the intrepid voyagers, four men and one woman, on the strangest, wildest, most daring journey ever attempted by man. After a ceremony that attracted more attention than a hotly debated political convention, the daring voyagers waved a final good-bye and entered the *Astronaut*, to await the arrival of the proper second, when the journey was to start.

The *Astronaut* was lying on a flat railroad car, with a locomotive behind it. As the engineer blew the whistle, the engine started to move and the cheers of the multitude ceased. During a moment of breathless suspense, the *Astronaut* moved toward the first of the powerful magnets. There was a tremendous, crashing sound as the *Astronaut* started through the magnetic gun, which soon changed to a roaring rumble like the discharge of many pieces of heavy artillery. The *Astronaut* increased its speed through the gun, up the curve and out of the cement muzzle of the great gun. For an instant the powerful searchlight on the tail of the rocket was seen rising higher in the sky and disappearing in the west. Many of the observers with powerful telescopes claimed to have followed its course for several minutes; but this was not officially verified.

The *Astronaut* was equipped with a powerful radio transmitter, which was expected to report every sound from within the *Astronaut*. George L. Davis, the reporter for the *Herald*, had promised to act as announcer and send messages back to the earth. Strange to say, his voice was never heard, after the first slow motion of the rocket, as it lay on the flat-car. Because of the electrical interference as they passed through the gun, not a sound came from the passengers. The radio continued silent as they passed through the atmosphere into that great vacuum known as outer space. No one can say whether or not the passengers were killed during those few minutes when the *Astronaut* was gaining her initial velocity.

At this moment, the *Astronaut* may be carrying five corpses. Only time can tell; but our hopes and the hopes and prayers of the entire nation, as well as those of the entire world, are with that small party, the first to attempt realization of the fondest dream of mankind, the conquest of outer space.

June 28.—The mystery which has surrounded the *Astronaut* was brought to light today when W. O. Mitchell gave our correspondent a manuscript, prepared by Dorothy Brewster, the young lady who financed the expedition. At last we can see why she guarded her secret so closely. Her story will appear in installments in the *Herald* as well as other Universal newspapers throughout the world. The first installment appears today, under the title of "The Man in the Moon."

June 29.—The Brewster Observatory is again a reality. No one can call it a hoax; as they did three years ago when several scientific magazines printed stories concerning it, and a fire that destroyed thirty eyepieces, making it unfit for use.

The observatory, which is now the property of Mitchell and Herrick of Chicago, is now fully repaired. During the last six months, no one has used it except Miss Brewster, who spent several nights during the full of the moon, watching the surface of the world to which she is now on her way. Those who are reading "The Man in the Moon," will be pleased to learn that the man in the moon is still alive, although probably not expecting a call from her. Now we know why she hopes never to return to the earth. The *Herald* wishes you luck, Dorothy.

W. O. Mitchell is watching the surface of the moon for some news of the *Astronaut*, which has not been heard from since it left the earth two days ago.

July 20.—W. O. Mitchell tells us that the *Astronaut* has reached the moon, but believes all her passengers to be dead. He describes the wreck of the *Astronaut*, which lies near a huge rock into which it evidently crashed when it first landed. No signs of any of the passengers were to be found; neither did he see anything that would indicate that they had ever left the rocket alive.

The fears expressed on that memorable night when the *Astronaut* was launched into space, that none of the passengers survived the rapid acceleration through the magnetic gun, are now almost universally believed to be realized. During the voyage something may have happened to cost them their lives; but the severity of the crash on the moon removes all possible hopes for their safety.

The entire world today mourns the loss of the five heroic people who gave their lives in a futile attempt to conquer the vastest thing in the universe—Outer Space. That they have not died in vain, remains to be seen. Before man first learned to ride on the surface of the sea, thousands of lives were lost. The conquest of the polar regions have and still continue to take their toll of human lives. The conquest of the air is not without many martyrs. It is therefore not surprising that the first attempt in conquering a barrier, far greater than any of these, should end in failure.

But our race is very persistent and does not know the meaning of defeat. Other scientists will begin where the unfortunate "Astronuts" left off, and boldly tackle the unknown; and they will eventually conquer and win the undying honor and gratitude of all mankind.

July 21.—Last night while photographing the wreck of the *Astronaut* for Universal News Service, observers at the Brewster Observatory saw a huge sphere, fully two hundred feet in diameter, approach the wreck. While this craft remained suspended in mid-air, a powerful ray, which instantly melted everything that it touched, was directed toward the wreck. The *Astronaut* was full of explosives and, as the ray touched these, the explosions were so great that the occupants of the sphere evidently became frightened and hurried to a place of safety.

The sphere soon returned and, from a higher altitude, completed its task of destruction. This confirms the story of Miss Brewster, that the moon is inhabited, by a race superior in mechanical progress to our own. But their ruthlessness in destroying the wreck of the *Astronaut* is even more barbarous than anything that ever happens in our own modern warfare. We at least make an attempt to rescue our helpless enemies, rather than destroy them.

Let us hope that these vandals never make a raid upon our world. If they do, no one can forecast the result. Never before were we aware of their existence, but now they constitute a menace. The Brewster Observatory intends to keep a constant watch and, if anything is seen that would indicate an invasion, or a war between the two worlds, every nation will be warned and no effort spared to repel the invaders. Their destructive passions will no doubt be stimulated if they should learn that it came from the earth, on what they might think a mission of conquest. In such a case they may return the visit with a fleet of spheres equipped with that destructive ray. This statement is not made in an attempt to excite or alarm the peoples of the earth; but rather to arouse interest among

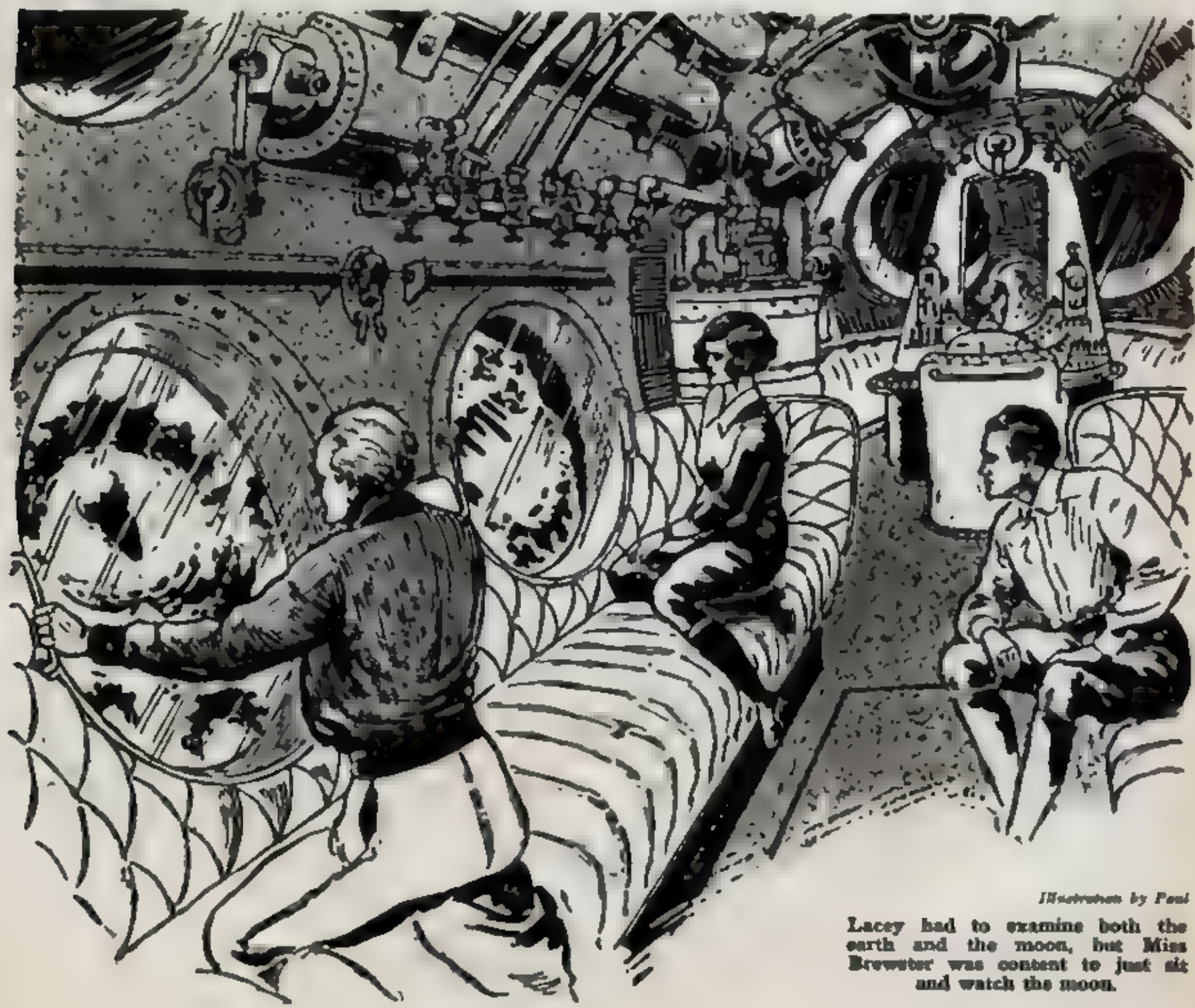


Illustration by Paul

Lacey had to examine both the earth and the moon, but Miss Brewster was content to just sit and watch the moon.

scientific men, who alone can save our race if the planet is ever invaded.

CHAPTER VII

Narrative of George L. Davis Resumed

AT nine o'clock we five "Astronuts" stood on the top of the rocket and smiled at the clicking movie-cameras. Probably I should have said four-fifths of us succeeded in smiling; but the one-fifth represented by myself was unaccustomed to such publicity. It was neither stage fright nor cold feet, but a combination of both, and other embarrassing emotions of fright, that seemed to tell me that I had better call my share of the voyage off. I was trying to summon enough courage to announce my decision, when the clicking cameras brought a mental vision to me:

I was sitting in a large theatre, in which a newsreel carrying my terror-stricken features, was being shown to the public. I overheard some lady say to her escort:

"There's that yellow reporter who backed out!"

I decided that I'd rather be a quarter of a million miles away.

At ten minutes after nine, the pictures had been taken and the seven bands had united as near the *Astronaut* as possible. Following one of Miss Brewster's whimsical impulses, the united bands began playing one of her old favorites—"Over the Hills Comes the Sunrise." I could not agree that this song was exactly appropriate for the occasion; but she said she wanted the last sounds she would probably ever hear on the earth to be this old favorite. Some one in the crowd started singing and the multitude followed his example as we waved our final farewell to our friends and entered the *Astronaut*.

All sounds become inaudible as the heavy doors were closed and fastened from the inside. After making a final inspection to see that everything was as we left it and no stowaways were hiding inside, we fastened ourselves in our padded seats and waited for the start. At the proper instant a slight jar and vibration told us that we were in motion. The speed increased as the engine behind gathered power. Suddenly we entered the field of the first magnet. The *Astronaut* shot forward with a violence that would have knocked us from our seats, if proper precautions had not been taken. Before we had a chance to wonder what had happened, the shock was repeated.

After the third magnet had given us its power, we were unable to count the rapid jerks. It seemed that I was lying flat on my back with my feet in the air and my body weighed a ton. Each jerk doubled this sensation. I could not raise my hand, it was too heavy. My eyeballs seemed to be driving themselves into my skull; my chest was so heavy I could not draw a breath. My head ached; blood vessels seemed ready to burst. I was sick at my stomach; I wanted to vomit but the contents of my stomach were too heavy. I was choking. Tons of invisible weight pressed against my body; the agony in my abdomen doubled a dozen times each second and I felt that I was slowly being crushed beneath my own weight. My heart fluttered and I thought the weight of my other organs would cause it to stop entirely.

But still the weight increased as the speed of the *Astronaut* continued to accelerate. I could not turn my head to look at my fellow passengers, who were no doubt suffering as much as I. It seemed to take years to go through that gun. I could no longer see, my vision was blurred, everything was out of focus and whirling like a top. My head ached and my brain felt like a mass of molten metal. The weight no longer increased by jerks, but a steady increase as if I were being buried under tons of sand. For some time I was unable to breathe—I was suffocating!

Suddenly this all stopped; instantly my weight became normal or less than normal, it seemed to me. I drew a breath of air and tried to look at my friends. I was dizzy and the *Astronaut* seemed to be turning end over end. After a strenuous effort, I succeeded in adjusting my eyes to the point where I could see. My companions were all so still and silent and I had visions of a mad journey through space in the ghastly company of four corpses. At last Winters moved his head; he was trying to look at me, but from the way he was rubbing his eyes, his vision also was imperfect. My back ached and as I thought it was broken I had no desire to attempt to move.

Soon I heard a groan. Lacey was beginning to come to his senses, but Dr. Haverfield and Miss Brewster lay as if dead. Fearing for her safety, I succeeded in releasing myself and with painful efforts began crawling over to her. But Winters had reached her first; he had raised her head and was asking for water. I hurried down the ladder to the kitchenette to get some water from a two-gallon container fastened to the wall, but found that it had failed to stand the strain of the acceleration. It had burst and the water had rushed to the rear of the rocket, soaking part of the explosives. Thinking of the larger barrels, I went to the next room and was relieved to find everything there intact.

When I returned with the water, Miss Brewster had opened her eyes, Lacey was struggling to his feet and Dr. Haverfield, whose age was against him, was in a serious condition. For almost an hour we were all too sick to try to see what progress the *Astronaut* was making; and I suddenly remembered that the world was waiting to hear my voice over the radio.

Sunrise in the West

IT had been my intention to watch the earth as we left it to see if it really did seem to drop out from under us, as all fiction writers said it should. But I was too sick to care whether it fell away from us or was following us. The other passengers were in the same condition. I was once seasick on Lake Erie; but that experience was mild compared to space-sickness. For now, everything possible was out of tune. All parts of the body pained; even the bones felt as though they had been crushed. But the worst pains seem to settle in the chest, abdomen and head. Lacey says space-sickness is the wrong word; as this sickness was caused entirely by the acceleration of the *Astronaut* as we passed through the gun. It began to get better as soon as we left the gun and began to travel at a fixed speed.

Dr. Haverfield seemed to suffer the effects of the acceleration more than we younger passengers did. Winters, being the strongest, and I, the lightest, were the first to recover. Lacey and Miss Brewster were not far behind; but Dr. Haverfield, who was at last able to take command, continued to suffer with pains in his head and side during the entire journey.

It was over an hour after we had left the earth that Winters and I began to take some observations. The moon was shining with a brightness such as I had never seen from the earth but the earth was entirely

invisible, except for a gray twilight in the west. Having left the earth at night, we were still within its shadow. This appearance of twilight, however, was caused by the rays of the sun refracted through the terrestrial atmosphere. As we watched it, it seemed to grow brighter and spread from the north to the south. This was proof that we were still going and had not started to fall back to the earth. We had no idea what time it was, as every watch on the *Astronaut* had stopped at 9:25. We had been careful to select non-magnetic watches so that they would not be damaged by the magnetic influence of the gun; but the acceleration had done its work. Mine was stopped so completely that I never did get it to run again; but the others, being more carefully selected, were uninjured.

When Lacey had revived enough to take some interest in what was going on, he had to examine both the moon and the earth. But Miss Brewster was satisfied to sit in her seat and watch the moon.

"I'd enjoy nothing better than just sitting here, watching the moon increase in size, for the remainder of the journey," she said.

At last Dr. Haverfield staggered to his feet and looked at the moon. He then looked at the earth through a periscope and did not seem to think the gray light was bright enough.

"I do not think we have the speed we expected. We seem to be standing still and that is impossible in outer space. If we are not going ahead, we are falling back to the earth. If that should happen, our enemies would have the laugh on us indeed. All we would have succeeded in doing would be to break the altitude record, and I do not care to sacrifice my life for that distinction alone. I think we should have some explosions on the rear to see if we can not get out of the earth's shadow and give the black screens a chance. Lacey, give us the explosions; Winters, get your screens in readiness to use as soon as the sun appears; Davis, see what the electric thermometer says."

"It now reads 432 below and is still falling," I reported after examining the instruments as I had been instructed.

"Cold enough to freeze hydrogen, but it will rise when we leave the shadow. The walls of the car still retain a little heat, or the thermometer would read 459 below. How does that western horizon look now? I think it is about time for the sun to appear."

A bright silvery light was now visible on the horizon which extended for over a thousand miles. Far to the west, bright clouds of gold and orange could be seen. As we watched it, the light grew brighter and presently a thin golden line came into view.

"That is the reflection of the sun's rays on the Pacific," I said: "As we get farther away from it, that line will grow wider and soon the sun himself will be seen."

For a few minutes we scanned the western horizon, but the silvery ring failed to grow wider. I reported to Dr. Haverfield, who asked Lacey to see how far we were away from the moon. Lacey did this by measuring the apparent diameter of the moon. Since the angles subtended by bodies are in proportion to their distance, it was but a problem of simple arithmetic to obtain our distance from either the moon or the earth. When his calculations were complete, he reported to our sick captain.

"Not close enough for the time we have been traveling. That gun should have been ten miles longer to give us the proper speed. Davis, do you see anything of the sun yet?"

"No," I replied, "and that silvery ring seems to remain about the same."

"Then we are falling back!" Dr. Haverfield cried: "Give us some more explosions, boys; we must get out of this at once!"

Miss Brewster broke her silence with a remark that was quite a contrast to Dr. Haverfield's excitement:

"I see no cause for alarm. Those explosions are unnecessary; they should be saved for a time when we will need them worse. That silvery ring now extends almost from the north pole to the Antarctic circle. It is not the reflection of the sun's rays in the Pacific, as Davis said, but the refraction of the rays through the lower atmosphere. It looks much brighter than it really is, because of the contrast with that black pitchy darkness seen throughout the entire sky. We will see the sun before his reflection appears in the Pacific. Let us be calm and take things easy, for we are about to see something that was never seen on the earth: sunrise in the west. I think a little song would be good for our morale; how about 'Over the Hills Comes the Sunrise'?"

By the time the song had ended, the sun's thin disc was shining through the earth's atmosphere at the extreme western horizon. This news was carried to the captain, who was still unwilling to leave his easy chair.

"Sunrise in the west! How I wish I felt like going to the window to see it."

A New Force

AND such a sunrise as it was! As the sun slowly crawled from behind the earth, it looked twice as flat as it ever did when seen from the earth. It was of a dull red which slowly changed to orange. The reflection mirrored in the ocean gave the appearance of two suns. As the sun passed beyond the atmosphere, his brightness increased until we could no longer look at him. His rays were producing results inside the *Astronaut*. We had come out of night into day; the radiant solar heat passed through the windows, giving us a warmth that was quite a contrast to the temperature of practically absolute zero, which the electric thermometers on the side of the rocket opposite the sun now registered.

The sky which had been blue when seen from the earth was now as dark as Winters' absolute black screens. Flame or bright smoke was to be seen rising from the sun to a height of almost one quarter of his diameter, which would make it about 200,000 miles high. Dr. Haverfield said that during eclipses, solar prominences were seen to rise from 350,000 to 500,000 miles high; but at this time the sun was comparatively quiet. Bright stars were to be seen very close to the sun; which is something never possible to see from the earth.

The earth looked very beautiful now, a thin crescent of silver, surrounded with a soft blue envelope through which nothing was visible on the earth except water, air and clouds. The only visible part of the illuminated hemisphere was the Pacific Ocean. Large clouds hovering over the lower Pacific made such a beautiful sight that we could not resist the temptation to photograph it.

As the sun was still getting farther away from the earth, we knew that we were still traveling under our initial velocity. The speed did not seem to satisfy Dr. Haverfield, who was afraid of falling back to the

earth. He ordered Winters to place his black screens over the windows exposed to the sun, to see if they would increase our speed.

Lacey, who had been measuring the apparent diameter of the earth, made his report to his commander in chief: "We are now 7500 miles from the earth; it has been three hours and thirty-seven minutes since we left the earth, as near as I can estimate the time. That makes our average speed thirty-five miles per minute. Since it was sixty-three when we started, our present speed is now about twenty miles per minute."

"Too slow," muttered Dr. Haverfield. "Two more hours and we will be falling back. If those black screens do not help us out, we must resort to explosives."

Winters was having some trouble in putting his screens in place. One of them got away from him and flew entirely across the room, striking the opposite wall with such force that the frame was broken.

"There is some force behind that," I remarked.

"Yes, and we need force behind it, too," he replied: When they were in place, we could actually feel the *Astronaut* accelerate her speed.

"I believe there is no longer any danger of falling back to the earth," said Dr. Haverfield: "I think I shall take some aspirin and try to sleep this headache off. It would be a good time for the rest of you to get a little sleep too, as it must be about 1:30 A.M. Arizona time. But someone should stay awake to call us if everything does not go right."

We were all very sleepy but, as there was nothing to be done and I was the least important member of the crew, it was decided that I take the first watch. Miss Brewster said she was not very sleepy and volunteered to stay awake with me. This pleased me very much, as I had never had the opportunity to be alone with her during the two years I had known her.

Since the windows on the side next to the sun were covered with the black screens, the earth could no longer be seen except through the periscope. To one unaccustomed to the use of that instrument, a wrong impression as to the size of objects is given. However, we did not pay much attention to the earth, but confined our attention to the moon. Miss Brewster had placed a large chart of the moon on the wall; and we compared it with the surface of the moon, whose large craters and mountains were quite visible. She told me the names of the craters and seas and pointed out the spot on which she wanted to land. Another sea bottom looked better to me, but she said its surface was more rugged and irregular. Furthermore, there were no mountains with caves in which to hide when the long lunar night arrived with its intense cold.

The moon was so interesting when she showed it to me and her company was so delightful that I determined to make the conversation last as long as possible. It is seldom that one meets a woman who knows as much about any scientific subject as she knew about the moon. She was the only person alive who had ever seen life on the moon, the only one who had ever examined the surface of our satellite and discovered the invisible lunar atmosphere.

I could not conceal the fact that I was desperately in love with her, and I thought this would be a good time to take advantage of my rivals.

"Dorothy," I said, "why are you so cold toward me? Why can't you return a little affection?"

"Mr. Davis, how many times have I told you to call me by no other name than Miss Brewster? I will not permit any of you to get familiar enough with me to call me by my first name. Never let me hear you call me Dorothy again."

I always had the name of being a ladies' man, but there was something about this girl that made her wishes respected. I could not even try to batter down her resistance. She was the first of her sex to make me feel bashful; that was probably due to the fact that this was the first time that I was ever really in love. But at any rate, I continued to call her Miss Brewster, and shall continue to use that name throughout this manuscript, regardless of all laws of journalism.

Her anger was of short duration; two minutes later she was describing the Sea of Serenity as if nothing had occurred between us. Who could fail to show respect for a woman like that?

After several hours of conversation, during which the moon increased in size until every crater and mountain was distinctly visible, Miss Brewster remarked that she was getting hungry. She went to the kitchenette and prepared some sandwiches and coffee, after which we called our fellow passengers.

A Great Danger

DR. Haverfield's headache was not greatly improved. He remained in his seat and asked Lacey to take our bearings and see what progress we were making.

"We are going too fast!" Lacey shouted as soon as he saw the moon! "Winters, remove those black screens at once and look at the earth. See how large it is now."

After making a few calculations, he reported to Dr. Haverfield: "We are now 70,000 miles from the moon and 180,000 miles from the earth. We are far from being on a straight line between them; we have been thrown off our course! We have been going too fast! The ray of propulsion did it! We are lost! We will soon cross the orbit of the moon; yes, we will be thrown beyond the orbit of Neptune! Why did we ever trust Davis and Miss Brewster alone?"

"Let me see for myself," Dr. Haverfield replied: "It was foolish to trust a reporter to guide the *Astronaut*. It would have been all right with him if the planet Saturn had whizzed past the window. I am afraid there is no hope for us now; we will be carried far beyond the moon's orbit."

"Be patient, Dr. Haverfield," said Miss Brewster: "Eat this sandwich and drink this coffee, and you will feel better. Probably you can save us yet."

"I can't be bothered with food now; we are in danger—a terrible danger! every second is precious. Boys, give us some explosions on the nose and the side of the rocket opposite the moon and don't be afraid to make them strong. Winters! where are you? Get those infernal screens off the window immediately! Let me alone, I want to make some calculations. This headache is driving me crazy. Miss Brewster, get me some more aspirin."

When Winters and Lacey had removed the screens, a great difference was felt in our weights at once. While the ray of propulsion was accelerating our speed, our weight was about normal, but now the acceleration stopped and our distance from the earth was so great that the force of gravity was very slight. When the explosions were started, it was necessary to hold to our seats to keep from being thrown against the opposite wall.

We ate our sandwiches in silence, and our coffee refused to stay in the cup. The *Astronaut* rocked and swayed under the terrible reaction of the explosions.

The moon was almost full when we left the earth; but now we were so far to one side of it that it appeared but little larger than a giant half-moon. The earth was more than a crescent; the coast of Asia, the Philippine Islands and the continent of Australia were plainly visible. It would have been a very beautiful sight if it were not for the fact that we were lost and too terrified to enjoy it.

Miss Brewster was getting impatient too, as her selected landing place on the moon was now far on the eastern side of the moon, almost out of sight. It looked as if it would be impossible to land there; but Lacey thought it would be very lucky if we made a landing on the moon at all. Presently Dr. Haverfield stopped figuring and looked at us. His calculations were finished and he was ready to report. Eagerly we waited for him to speak, but it was fully two minutes before he opened his mouth.

"The ray of propulsion has been trying to drive us away from the sun with the velocity of light," he said at last: "If our weight had been zero and those screens had covered the entire rocket, we would now be traveling at a velocity approaching that of light. But, fortunately, the combined gravity of the sun and earth have been pulling us back and we did not use but a fraction of the sun's power. We will now use the screens on the side of the rocket opposite the moon; some sunlight is coming in there and probably, with the aid of the explosions, we can drive the *Astronaut* into the gravitational field of the moon. We will be safer then, but probably our landing will be made in darkness on the other side of the moon."

During the next two hours, we were all busy trying to change the course of the *Astronaut*. Black screens were used on various windows, and the explosions kept hammering away like riveting hammers, filling the heavens with smoke. Miss Brewster and I, who had both been awake for over thirty hours, ate a light lunch, strapped ourselves in our chairs and went to sleep.

CHAPTER VIII

Two Volcanoes?

WHEN I awoke a few hours later, Dr. Haverfield was again asleep. Miss Brewster, who had risen earlier than I, was now helping Lacey and Winters look at the moon. The explosions had ceased entirely.

"Where are we?" I asked.

"We crossed the orbit of the moon a few minutes ago," Lacey answered. "She is now about 10,000 miles away, coming toward us like a cannon ball. We will be out of her path when she gets here, but within her gravitational field. We may make a landing on the dark side; or we may go completely around the moon like the Verne projectile, and return to the earth."

"But no one was hurt when the Verne projectile landed in the Pacific."

"If we fall back to the earth, we will have to use a lot of explosions if we expect to be playing dominoes when they find us," he answered.

"Is there nothing we can do?" I asked.

"Nothing but wait. I think we should try to get closer to the moon but Dr. Haverfield says he thinks we are at the proper distance to let Nature take care of us. You see it is like this:

"The moon is coming toward us at the rate of .64 miles per second or 38.4 miles per minute. If we were to remain still, she would reach us in four hours and twenty-one minutes. Our present velocity is now about twice that of the moon and her gravity is drawing us toward her. We are not traveling exactly toward her, but in an angle that will cause us to circle her as a sub-satellite. In about two hours we will enter the moon's shadow. As the moon and the *Astronaut* are going in opposite directions, we will cross her shadow in about twenty minutes. If we can continue in a circle around her, without getting any farther away, we may be able to use light-pressure when we again get between the sun and the moon, and drive our rocket to the surface. Dr. Haverfield is not feeling much better and we have agreed to let him sleep until we are about to enter the shadow. He wants to take our bearings and make some calculations at the time."

By this time the earth appeared only about four times as large in diameter as the moon looks to the observer on the earth. It was very beautiful, a silvery crescent looking like a giant new moon, except for the effects of the atmosphere. The moonlight on the clouds that hung over the dark portion of the earth gave it the appearance of silver, while those over the illuminated portion took the appearance of purest gold. A blue vapory form circled the edge of the entire globe, even on the dark side.

The moon was no less strange. A giant globe full of big black holes, with one spot on the luminous edge that was almost blinding—Mt. Tycho, the unexplained mystery of our satellite. As I watched Tycho, it swung around, disappearing behind the curvature of that globe. The moon appeared to be slowly rotating on her axis; the lighted part was becoming smaller and soon looked like a new moon. What a strange sight! A giant new moon and a new earth, both visible from the same window!

Realizing, as the crescent of the moon became smaller, that we were nearing the shadow, we decided that it was time to call Dr. Haverfield.

He estimated our distance from the moon to be 7500 miles. "Too far away yet," was his comment. "Besides, we are traveling too fast." He ordered explosions on the nose to check the speed and more explosions on the side to throw us closer to the moon. Miss Brewster turned on the lights while Lacey and Winters regulated the explosions. The sun and moon were now side by side and getting closer all the time. With a smoked glass, we watched the solar eclipse. The moon quickly covered the sun and all was dark as the *Astronaut* sped onward, entering the shadow on the other side of the moon.

It was unfortunate that the first human beings to be on the other side of the moon could see nothing but darkness. But even in the dark, one can see much if he keeps his eyes open. An active volcano, shooting flames and sparks into the sky, surprised us all, who had been of the opinion that there were no active volcanoes on the moon. A moment later a meteor appeared directly below us, followed by another an instant later, sending a shower of sparks like a rocket.

"That is the first evidence of that invisible atmosphere, Miss Brewster," said Dr. Haverfield. "Those meteors behaved exactly like meteors do at home, except they seemed to burn faster. Probably there is more oxygen in the lunar atmosphere. But what mystifies me is that volcano!"

"Are you positive that it was a volcano?" asked Miss Brewster, who was trying to look at the dark surface of the moon.

"What else could it be?"

"Let us suppose a space-flyer from another world should visit the earth and pass over Pittsburgh or Youngstown at a distance of but a few thousand miles. They might think they had seen two volcanoes."

"Do you mean to advance the theory that we saw a city or a steel mill?"

A remarkable photograph of the moon—u[illegible] by Dorothy Brewster in exploring the Lunar craters with her telescope. Th[illegible]verted. From "The New Astronomy," by Dr. David Todd, American Book Company.

"We may see stranger things than that before we get back home. Truth is still stranger than fiction," she replied as unconcerned as ever.

Dr. Haverfield could do nothing but sit with his mouth wide open, amazed at this strange girl who was now singing her favorite song.

Above the Moon

"IT is about time we saw the sunrise ourselves. It has been twenty minutes since we entered the shadow. Perhaps the boys have succeeded in slowing down our speed."

We continued to watch for the sun, but there was no sign of it. Fifteen minutes later, when it did come, it was unannounced. As suddenly as if someone had turned on an electric light, the sun appeared on the edge of the moon with a brilliance never seen from the earth. As soon as the bright crescent of the moon appeared, Dr. Haverfield calculated the distance at a

trifle over two thousand miles. This was just about the distance of the moon's diameter; but as his calculations gave him the distance from the center of the moon, the radius of 1080 miles could be deducted, making the distance about 900 miles.

"We are falling onto the moon!" Lacey exclaimed: "Maybe I had better stop my explosions and start them on the other side to check our fall."

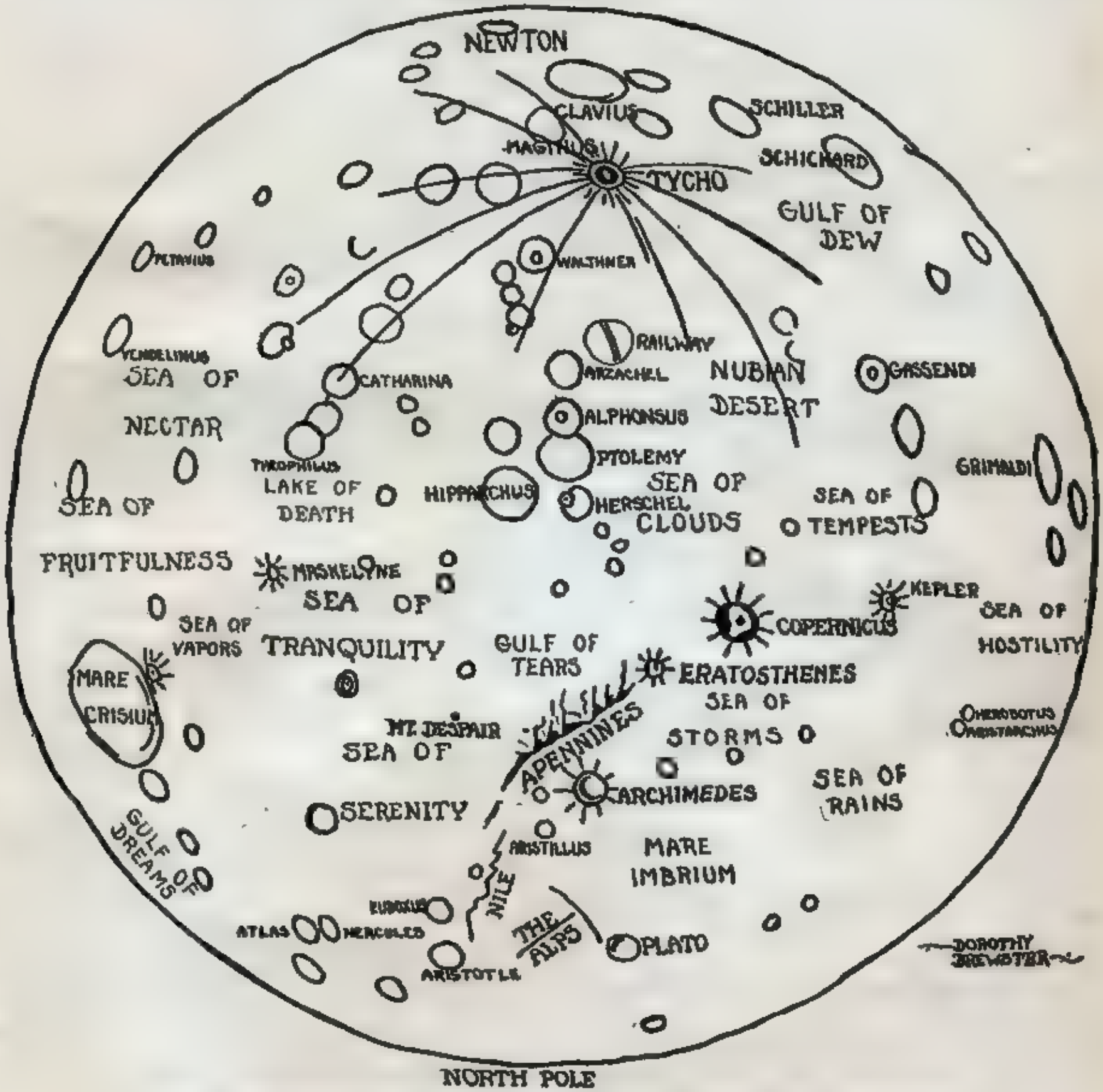
"Don't you dare!" shouted Dr. Haverfield. "The moon is now traveling away from us and our distance of a thousand miles will soon be lost. Continue the nose explosions. Give us some at a forty-five-degree angle and bend our path into a smaller orbit around the moon."

A few minutes later, our distance was estimated at 1500 miles, but as the explosions continued, this loss was soon made up and we were getting closer again.

"Here is a dangerous point," said Dr. Haverfield: "We are headed directly toward the sun and the earth. Their combined gravitation, in addition to our own speed, may draw us entirely away from the moon; for the gravity of the latter is very weak. Use a little light-pressure to offset this danger and check our speed."

"Do you see that dark circular depression just ahead of us?" asked Miss Brewster: "That is Mare Crisium, the home of the flat-footed selenites. We want to land about a thousand miles farther west, in the Sea of Serenity."

"Our speed must be checked, or we will go beyond



Map of the moon—corresponding to the photograph on the opposite page. In the lower left center is Mt. Despair, where Dorothy Brewster found the man in the moon. This, too, is an inverted image as seen in an astronomical telescope.

that sea bottom and make an unpleasant landing in the Apennine Mountains. We are now about five hundred miles from the surface and our speed is about one and one half times that of the moon; which makes it about 57.6 miles per minute with reference to the earth. But we are now going in the same direction as the moon, so with reference to that body, we are traveling about twenty miles per minute or one mile in three seconds. That is too fast to attempt a landing. Winters! What is the matter with you and that light-pressure? I asked for it some time ago!"

"We're coming, sir," he answered as he saluted the captain and placed a screen over a window. Instantly the effect was noticed. We were now in the field of the lunar gravitation, that of the earth was almost negligible and our bodies did not seem to weigh over ten pounds. As soon as the screen was in place, it seemed that the *Astronaut* had suddenly stopped; our bodies and every loose object were thrown violently to the front end of the car.

"We can't have much of that!" said Dr. Haverfield: "We do not know how to use the ray of propulsion. Every time we try it, we get into trouble. Put your screens away and we will try something milder. Lacey, how about some dynamite explosions?"

The moon was now so large that we could no longer see all of its surface from one window. We had crossed Mare Crisium and Mt. Proclus. The Sea of Serenity was directly ahead of us, with the lofty peaks of the Apennines looming in the distance. The few minutes during which we had used the black screens had checked our speed and thrown us nearer the surface. But our captain ordered more explosions to lessen our speed still more. He wanted to descend to within a few thousand feet of the highest craters and he did not want much speed when we passed them.

At last, when we were about forty miles high, the *Astronaut* started behaving rather strangely. She was now drifting along with her rear end pointed toward the moon, but started to rock and swing like a pendulum. At last she turned completely over on her side and kept on going nose first.

"What has happened?" I asked: "Did we hit a mountain top?"

For several minutes no one could give any reason for this strange behavior. It was Miss Brewster who broke the silence:

"We have entered the moon's invisible atmosphere. The wings and rudders on the rear have raised that end of the car and we are now traveling nose first as all rockets should travel."

"Yes, and did you notice how the *Astronaut* swings and rocks like a barrel floating in the water?" asked Dr. Haverfield: "I want everyone to get busy and carry our heaviest weights to what is now the bottom of the rocket in order to give us more equilibrium."

As we obeyed this order, I could not help noticing that our luggage was much lighter than when we left the earth. I had no trouble in lifting a barrel containing sixty gallons of drinking water. It did not require but a few minutes to move our entire cargo, but in the meantime, the *Astronaut* was more than half way across the Sea of Serenity. The Apennines were raising their lofty peaks directly across our path and a crash seemed inevitable.

"All the nose explosions you can give her!" shouted the captain. "We must stop this rocket before we cross the sea bottom."

His orders were instantly obeyed. From ten points on the nose of the *Astronaut*, explosions were started with no thought of the consequences. Within ten minutes we were within twenty miles of the mountains and a crash seemed certain. But just then the unexpected happened.

A Man on the Moon

OUR speed had greatly diminished, under the terrific blows of the explosion, and we were surprised to see a distant peak, directly in our path, swing around to the right! We were now headed to the left of it and to our surprise the *Astronaut* turned completely around and started in the opposite direction. We were dumbfounded! What had caused the *Astronaut* to sense her danger and turn around and begin crossing the Sea of Serenity in the opposite direction?

Dr. Haverfield ordered all explosions to stop instantly. Within half a minute, he had an explanation. He ordered the explosions to continue on the under side of the rocket while he gave his explanation:

"The moon travels in her orbit at the rate of 38.6 miles per minute. When our speed was reduced to that point, we were standing still, with reference to the moon, but those nose explosions still continued. Our own senses failed to tell us when we had stopped, but the recoil of the explosions started us in the opposite direction. The *Astronaut* could not go backward with those rudders and wings on the rear end, so she was compelled to turn around. We stopped the nose explosions at that point and prevented turning again. Our speed is now very low, probably not more than one hundred miles per hour and we are not far from the surface of the moon."

As we looked out, we could see the truth of the latter statement. We were not more than a mile high and were still falling. Explosions on the lower side of the rocket were started instantly in an attempt to check our fall. This attempt did not succeed until we were about one thousand feet from the surface. We remained at that altitude and travelled horizontally with the speed of an express train across the dry bottom of the ancient Sea of Serenity.

Had we tried to check our fall at a height of one mile on the earth, the results would have been different. But on the moon, where the gravity is only one sixth as strong, a body falls but two feet and seven inches during the first second. Each explosion on the lower side of the rocket was capable of lifting it six inches. Explosions from five points, once per second, were capable of supporting the weight of the *Astronaut*. This was better than we had expected. Our explosions on the side would enable us to guide our craft and we could land at any point desired. When Dr. Haverfield noticed the ease with which we could control the *Astronaut*, he called to Miss Brewster:

"Where did you say you wanted to land?"

"At a point about forty or fifty miles from here, over in that direction. Do you see that crater top on the horizon? It is just straight ahead and a little to the right; do you see it? That is Mount Despair. I had hoped to land within walking distance of it."

"A few nose explosions, Lacey, and an occasional one on the left. Keep your altitude and go ahead. The rest of you get your telescopes and strap yourselves in your seats, we are going to make a landing soon."

We lost no time in obeying this order and two min-

utes later we were anxiously scanning the horizon with our telescopes.

"Look for a large cave at the base of Mt. Despair," ordered Miss Brewster.

A few minutes later, Winters, who was looking out a window on the opposite side, announced that he saw a smoke.

"Where?" we all asked at once.

"About two miles over there to our right. I think I see something moving too."

Instantly all glasses were turned to the direction indicated and we distinguished a half-naked man, standing on a high rock, waving a burning grass torch!

"Of all things! A man!! A human being!!!" exclaimed Dr. Haverfield. "Who do you suppose has come here ahead of us? Make a landing at once."

A Forcible Landing

HERE was one order that could not be instantly obeyed. We were about one hundred and twenty-five feet high and moving at about sixty miles an hour. In his excitement, Lacey increased the nose explosions and stopped those on the under side of the rocket. With no support beneath it, the *Astronaut* dropped to the ground. A drop of 125 feet on the earth would have been fatal to everyone, but with the low gravity of the moon, it was less severe. We hit the surface at the speed of about thirty-six feet per second, which is about the equivalent to a fall from the height of twenty-five feet on the earth.

The shock from falling was not as disastrous as our horizontal speed of about sixty miles per hour. The *Astronaut* bounced at the first impact, but the next time, she landed on her nose. The nose explosions only added to the confusion and the *Astronaut* turned completely over and kept on going with unchecked speed. The friction between the car and the moon was not enough to check her momentum, so she continued to keep on going, turning end over end and rolling like a log for at least a mile, to end in a mighty crash into a rock about forty feet high.

This severe landing was much as I had expected, but that did not lessen the severity in the least. Two wooden barrels of water were burst open, as well as some of our food supplies; although an examination of the latter proved that no damage was done. The biggest wonder of all was the fact that the heavy load of explosives did not ignite and blow us all into eternity.

The nose of the *Astronaut* was smashed, the rudders were torn off and almost all of the windows were broken and we were breathing lunar atmosphere before we realized it. The air had a chemical odor of a kind that even Winters could not identify; we did not like it, but as we continued to breath it, it became less objectionable. For several minutes we felt too dizzy and shaken up to move, but at last Miss Brewster called:

"Is anyone hurt?"

One by one, we answered "No."

"Then let's get out of here."

She was the first to disentangle herself and crawl out of a broken window and set her feet on the surface of the moon. She attempted to walk, but the low gravity caused each step to carry her several feet into the air. By the time her four companions had crawled outside, she had jumped to the top of the *Astronaut* and from there to the high rock, where she stood with her binoculars at her eyes, scanning the horizon.

"Gentlemen, Christopher Columbus has been outdone!" she cried: "We have discovered a new world for our earthly endeavors. We shall call this rock San Salvador, and carve our names on it and in history at the same time. Hurrah for the twentieth century!"

"Hurrah! Hurrah for Miss Brewster!" shouted Lacey, Winters and I at one breath. But Dr. Haverfield did not join in the cheering. He called to Miss Brewster to come down. When she had obeyed, he pointed to the *Astronaut*, which was a total wreck, and said:

"I think it more fitting that we follow the example of our Pilgrim Fathers. Let us kneel beside the wreck of our Mayflower and give thanks to our Creator for bringing us safely across this uncharted void. This rock shall be named 'Plymouth Rock' and it shall serve as a monument to our voyage as well as an inspiration for the generations to come. My friends, let us pray."

CHAPTER IX

Miss Brewster Goes Walking

WE had been so severely shaken up by the unexpected landing that we men had not yet attempted to walk. Our exit from the rocket had been made by a painful crawl. Our emotions, at the thought of the success of our voyage, had crowded all other thoughts from our minds; but now, our prayer being over, I rose to my feet for the first time. In attempting to walk, I was due for another surprise. I had expected the low force of gravity to make walking difficult; but I never imagined that it could be impossible.

When I rose to my feet, I unexpectedly rose into the air, only to fall in a more awkward position than when I had started. Rising more carefully the next time, I managed to get up without an accident. My first step lifted me into the air again, but I came down without falling. Throwing caution to the winds, I jumped as high as possible, which was almost thirty feet, and landed without any noticeable jar.

Lacey and Winters followed my example, and for several minutes we amused ourselves with our new jumping ability. The sensation was delightful; we thought we knew the sensations of a bird while flying, as we rose to a height of twenty-five feet and slowly dropped to the ground. Dr. Haverfield attempted to follow our example; but his headache had not left him and he was compelled to give it up and crawl inside the *Astronaut*.

Several minutes later, Miss Brewster made her appearance in an entirely new costume. It was an exact duplicate of the aviator's uniform she had worn during the entire journey, except that it was as white as snow. Her head was bare and her pretty bobbed hair never looked more beautiful. She carried a cute little white umbrella and had suddenly mastered the art of walking. Her movements were perfectly natural and she walked with a grace that was even more admirable than it had been at home. She carried a large but neat pack on her back and in my estimation, no daughter of Eve was ever more beautiful.

"Haven't you boys learned to walk yet?" she asked.

None of us could answer. We were so bewildered and surprised by her sudden change and mastery of the walking problem. Even Dr. Haverfield crawled out of the *Astronaut* to see her do the impossible. Her radiant beauty and exquisite loveliness only confused us and made us feel ashamed of the progress we had failed to make.

"Winters, where did you see that man signaling to us?"

"He was standing on a high rock about two miles to our right, when the *Astronaut* first struck the surface."

"I'd like to know just who that fellow is, where he came from, how he came here, when he came and why," said Dr. Haverfield.

"Is there anything else?" she asked.

"Yes, several things, but I'm afraid you can't answer them."

"Probably not; you must not expect too much from the inferior sex. When you boys learn to walk, you may take our baggage over to Mt. Despair and place it in the largest cave you can find on the side next to the earth. I am going for a little walk and may not return for a long time. Don't be uneasy, as I know this section of the country quite well."

With that she started out along the path of the rocket where it had dragged itself over the hard rocky surface of the dead sea-bottom.

"Come back here!" shouted Dr. Haverfield: "Boys, we can't let her go alone; it is not safe. Who knows what manner of savage that half-naked man may be?"

"Probably he has the same thoughts about us," she retorted as she started to run.

"Go after her, boys, and fetch her back! We can't let her risk her life alone."

This was a command that we found impossible to obey. Each step threw us high into the air, only to end in a tumble. While we were spending our time in picking ourselves up after each fall, she was hurrying over the ground with the ease, grace and speed of an antelope. Within ten minutes, she had disappeared below the horizon and we were compelled to give up the chase and trust her to her own resources, in which she seemed to have great confidence.

Illustration by Paul.

While we were picking ourselves up after each fall, she ran over the ground with the grace and speed of an antelope.

The Wild Man

FOR some time we struggled with the difficult problem of walking, but could not master it. The gravity was so slight that we felt as if we were submerged in water; our feet would not stay on the ground. We expected to learn to walk within a short

time, but after struggling for hours, under the hottest sunshine we had ever experienced, we were exhausted. We decided to enter the *Astronaut,* get something to eat and try to make up for some lost sleep.

"That girl is a mystery to me," said Dr. Haverfield when we had returned to the rocket: "Not only is she unlike the frivolous members of her sex, but her mentality surpasses ours. That telescope did not teach her how to walk; she knows every detail of this part of the moon well enough to have been here all her life. The ease with which she walks gives her secret away—she has been here before."

"Yes," Lacey answered, "and did you notice the direction in which she went? Did you notice the powder and female war-paint she had on her face? She has never used any of that stuff since we knew her. Who knows what is in those boxes? You can't tell me it is all food; there is enough there to feed a regiment for months. Did you notice how excited she was when we saw that wild man with a torch? She has gone to meet him; she knows who he is all right."

"Of course she does," Winters added: "She never told anyone but us of this lunar atmosphere. She would not let Davis publish anything about lunar conditions, and she admitted in her speech just before we started from the earth that she was keeping the surprise of our lives for us."

"To be sure, she knows him," I added, "or she would not have gone to meet him alone. She did not want us in the way, that's all. But if you mistrust her or think she is going to desert us or double-cross us, you are sadly mistaken. I trust that girl above everyone else. She admits she has secrets; but we are keeping a secret from each other and are not honest enough to admit it. I love Miss Brewster; Lacey, you and Winters love her too. We three are ready to fight each other for her; now be honest with yourselves and admit it. But has she ever given any of you any encouragement? Of course not, no more than she has given me, which is none! She just simply does not care for any of us in that way, but she is the best friend any of us ever had. She is just like a married woman of the old-fashioned type, who has no affection for anyone except her lawful mate."

"That is quite true, Davis," said Dr. Haverfield. "I have noticed that you three have been secretly in love with her for some time, but I fear that your cases are as hopeless as mine. I love her, I am not ashamed to admit it. At first I tried to love her as a daughter, but she is the perfect image of the woman I loved and lost thirty years ago. Her resemblance brings memories of her mother and I can not think of her except as the same person. I have never told you; Miss Brewster does not know it; but her mother and I were once teachers in the same high school in Denver. She rejected me and married William Brewster, the inventor of the giant telescope. I heard that she had died when Dorothy was born; but I never heard any more of them until I met Dorothy that day at Belmont. I recognized her instantly, but have kept my secret to myself. I could never marry Dorothy, even though she would have me; it would be too much like marrying my own daughter. But I will protect her as a daughter as long as I live, and you men are too civilized to let personal jealousies interfere with your friendship. We are but a small party, strangers in a strange world, and nothing could be more absurd than jealousy over a love affair that is hopeless for all. Let us be quiet now and sleep until she returns."

It was several hours later that I awoke. It was very hot inside the *Astronaut,* but it was hotter outside. Perspiration had been flowing freely and we were all wet. I decided to go outside and see if I could see anything of Miss Brewster. I took a telescope with me and jumped to the top of the rocket, and from there to the top of Plymouth Rock, and scanned the horizon.

Far in the distance, I could see something moving. I recognized Miss Brewster and that strange man coming toward us, walking very close together. He had one arm about her shoulder and was carrying her umbrella. The other arm was in violent motion; Miss Brewster's hands were moving in the same manner. They were trying to talk and could not understand each other, so signs and gestures were necessary to convey their ideas.

Here was a surprise and a mystery. Who was this strange man, who in a few hours had done something that all men of the earth had failed to do—to win the heart of Dorothy Brewster? What sort of a woman was she to repulse all the advances of the men of her own world, only to surrender completely to the first half-naked, brown-skinned savage she had met on the moon? Should I wake the others? No; the affairs of the heart are too sacred to expose. She need not know that I had seen her; I would jump to the ground and wait until they came nearer before calling my friends.

We had all been awake for a long time and were busy examining the wreck of the *Astronaut,* when the strange couple finally arrived. They were now walking hand in hand and were almost upon us before we noticed them. We were too astonished to speak, as we looked at her strange companion.

He looked more like an animated bronze statue of an ancient Greek god than a man. His physique was faultless, his muscular development was marvelous. There was something about his face that instantly told me that we were in the presence of a superior being. I felt like a four-flusher in his presence and my companions, even the learned President Emeritus of Belmont, appeared abashed before him.

At close range he did not appear to be the same savage we had seen trying to signal us with a grass torch some time ago. His dress was of the simplest type possible. It consisted of a single piece of a poorly-woven grass cloth, about a foot wide and twenty feet long. It was thrown over his left shoulder, wrapped several times about his body, once around each thigh, and ending by being tied about his waist. His hair was long and crudely cut behind his ears, but his face was as smooth and beardless as a woman's. He appeared to be a highly-cultured person, who had been depending entirely upon his own primitive resources and cunning for some time.

Baklo

"FRIENDS," spoke Miss Brewster, "I want you to meet the Man in the Moon. Four years ago I saw him through my father's telescope; but, until today, he has never seen nor heard of any of us. He does not know our language, but is learning it fast and we must learn his as soon as possible. He belongs to a race of men who live on the other side of the moon and we must get our airplanes ready and return him to his people.

"When I first saw him he was marooned on the

desert bottom of the Sea of Serenity. I watched him as he walked hundreds of miles, suffering the agonies of death at every step until he reached Mount Despair.

"I planned and financed this voyage for the primary purpose of rescuing him and I can not conceal the fact that my peace of mind, my future happiness and everything that makes life worth living depended upon the success of the expedition. It is the proudest moment of my life when I can stand before you and introduce Baklo, the Man in the Moon."

"Boys," said Dr. Haverfield, "let's give three rousing cheers for the plucky Miss Dorothy Brewster and three for Baklo!"

When this was done, she led Baklo to Dr. Haverfield and repeated the words "Doctor Haverfield."

Baklo nodded and then Miss Brewster pointed toward Dr. Haverfield's right hand. Baklo seized it in both of his and shook it with more sincerity, but less grace than any of our home town politicians. The same introduction and acknowledgment was given to each of us and we welcomed this strange man to our midst.

Our efforts at walking amused him greatly; but he did not do anything to ridicule us, any more than we ridiculed his appearance. Winters and Lacey beckoned him inside the *Astronaut,* where they selected some clothing for him and remained with him to show him how to use it. When they did make an appearance some time later, Baklo looked like a different man; no one could now mistake him for a savage.

While Baklo was dressing, Miss Brewster told Dr. Haverfield and me a long story of seeing this man marooned by a group of men who traveled in a spherical ship. She showed us some pictures which she had formerly kept hidden and told of several trips she had secretly made to the Brewster Observatory after the telescope had been repaired, and of seeing Baklo and knowing that he was alive before we started.

"But Miss Brewster," said Dr. Haverfield, "there is one thing I want to ask: How did you master the art of walking on the moon so soon?"

"Ha! Ha!" she laughed: "Pardon my merriment, but I thought you fellows were capable of using your heads. It is very simple and you should be able to solve the problem yourself. Look at my shoes."

Her shoes had extra thick soles, fully two inches thick. A closer inspection showed that they were made of lead! From her pockets she removed several heavy lead plates and the pack on her back contained more lead!

"I though you would know enough to weight yourselves down, if you were too light to walk. But I have weights enough, shoes and all for each of you. I will get them for you as soon as Baklo finishes dressing, and maybe you will be able to walk better."

"I admit that the joke is on us," said Dr. Haverfield: "But there is still another question to ask. Within a few hours after your arrival, you have met a man to whom you have never been introduced. You went out alone to meet him and when you return, you act like two newly-weds! Is it a custom among the Selenites to fall in love at first sight? Or, did you consider it good form to use leap-year tactics and offer yourself to him?"

"Dr. Haverfield! How absurd! You men are dreadfully stupid and very poor students of human nature. Is there any reason why the male should always be the aggressive sex? Is this always true among the lower animals? Now that we are away from the earth, I will let you in on a little feminine secret. If I had ever dared to tell you this at home, and the other members of my sex found it out, my life would not be worth ninety-eight cents.

"You men like to think you are the aggressive sex; you think you select the woman you want and by means of some magnetic qualities of your nature, you make her love you. Nine times out of ten, it is the lady herself who does the selecting and if she is clever enough, she will make you think you are chasing her and you will fall into her hands every time. As the poet says: 'Man's love is of man's life a thing apart; 'tis woman's whole existence.' So it would seem strange if she did not study the greatest thing in life and learn a lot of secret tricks of the trade.

"Women at home spend hours trying to improve their appearance, for no other purpose than to make themselves attractive to your sex. But did you ever notice that, no matter how deeply a man is in love with any woman, he never gets anywhere if she does not want him to? Did you ever notice that if a woman tries hard enough she can soften the heart of any member of the brutal sex? I learned all these tricks by observation, but never practiced them at home for the simple reason that I never saw a man that I wanted. But when I did see the 'only man', through my father's telescope, I determined to see what I could do with him.

"Through your help, I crossed Nature's greatest barrier. Today I made myself look my best and went to a place where I knew he would see me. After I had allowed him to admire me for an hour or more, without my seeing him of course, I decided it was time for action. Consequently, I managed to fall from a rock about the size of Plymouth Rock and fainted. I let him rescue me and kiss me twice before I decided to wake up and resist desperately.

"He had a hard time subduing me and it was not until I saw that rock with one of you men sitting on the top of it that I let him know that I returned his affection. Just to make sure that he would not forget so soon, I fed him. All women will agree that the quickest and surest way to a man's heart is through his stomach; and Baklo has a great appetite for barbecue sandwiches and apple pie.

"During the next few hours I tried to explain that we were from the earth, but I do not yet know whether he believes it or not. When you get your shoes, we will all walk over to his cave in Mount Despair, where we will make our home until we can get those Moth planes ready for use."

CHAPTER X

Baklo Goes to Work

DURING a period equal to two terrestrial days and nights, we were busy carrying our food supplies and other baggage to a large cave in Mount Despair. There were times when we agreed that this cave was of artificial origin; but there were also times when it appeared to be the work of nature. The entrance was entirely artificial. A large arch built of enormous blocks of stone, resembling no stone that I had ever seen on the earth, supported two massive stone doors on hinges of some unknown substance that looked more like stone than metal. The masonry bore the evidence of extreme age; they were probably very ancient when the Pyramids of Egypt were being built.

For ages the cave had been the nocturnal haven of

birds and beasts of some unknown species and it was not until we were far from the entrance that a place was found fit for human habitation. Here, Baklo had by hard work and uncanny ability made a home and workshop for himself, using the primitive means at his disposal. By a knowledge of chemistry that mystified Winters, he had a method of extracting oil for lighting purposes from a tree that appeared to be similar to our pine family, although the resemblance was not too marked. From the same tree and other strange forms of vegetation, he produced a food that we thought was very unpalatable. This, together with what food had been left him by his persecutors had served to keep him alive and combined with water, constituted his entire food supply. He did not seem to relish his former bill of fare after he had a sample of the food prepared by Miss Brewster. Apple pie and barbecue pork sandwiches pleased him immensely and even Miss Brewster found it impossible to get him to sample other food that might prove inferior.

Somewhere near the cave, he had located deposits of ore from which, by a primitive means of smelting, he had fashioned tools, cooking utensils and strange but simple pieces of machinery. From the tough fibres of a lunar grass, he made threads which were later woven into cloth. The experiences of Robinson Crusoe were no more interesting than the handiwork of Baklo.

He took a great interest in the objects within the *Astronaut*. The padded chairs were very strange to him. The airplane engines, which Lacey was trying to repair after the crash, aroused both his admiration and his contempt. Gasoline was unknown to him but, when he found that it could be used to make a light superior to his tree oil, he considered it very valuable. There was nothing about our explosives to arouse his interest; but the radio was the most interesting thing of all.

Miss Brewster, who could make him understand better than the rest of us, tried to explain its use to him. He appeared to understand her and a delighted twinkle came to his eye as he began taking it apart. Since it could no longer be used for communication with the earth, we made no objections when he asked to take it to his own workshop for further study.

Miss Brewster and I helped him carry it to the cave, where he began work in earnest. All of our attempts to use it brought nothing but terrible squeals and screams of static which aroused the contempt of Baklo. He indicated that no radio should behave like that and began tearing out coil after coil, only to rewind them after a manner of his own. While Lacey, Winters and I were trying to repair the damage done to the airplane motors, Miss Brewster and Dr. Haverfield were watching this lunar mechanic working with a terrestrial radio.

The sunshine was so bright and hot that we found it inconvenient to work outside, so we were most always in cramped quarters inside the *Astronaut*. There were times when we were tempted to abandon the job as hopeless but, when we considered that it was the only thing we could depend on to get away from that lonely spot, we decided to exhaust every effort before we abandoned it. At times Baklo would come to us to see what we were doing, but he never remained very long. On one occasion he tried to make his wants known but we could not understand him. He asked to make a search himself, which he was permitted to do. I went with him to see that he did not get into trouble with the explosives. He searched for over an hour and at last found a small hand-bag that belonged to Lacey. He tried to open it; but it was locked, so we asked the owner thereof for the key. Lacey obligingly opened it for him and Baklo went into a frenzy of delight when he found three spools of fine insulated wire inside. Lacey indicated that he could have them, and Baklo broke all speed records in getting back to the cave and his own workshop.

The sun was now close to the horizon and we knew that we would be unable to work after the long lunar night arrived. We decided to gather up all of our tools and place them inside the *Astronaut* and take only such things as we would need to the cave with us. When we started to the cave, Lacey remarked that the rubbish we had left near the rocket made it look as if the crash into Plymouth Rock had smashed it to pieces.

The Rescue

WHEN we reached the cave, Baklo was in a frenzy of delight. He had succeeded in making the receiving set work and was actually getting music from the loud speaker. At first I thought we were listening to a terrestrial station, but a strange unearthly strain of the music convinced me of my error. After spending a few hours in sleep, Baklo began working with the sending apparatus. We became interested when we learned that he was trying to get in touch with his own people. Miss Brewster told us that, if we were able to communicate with them, there would be no necessity of repairing the planes. We then began helping Baklo; but I doubt if we were of much assistance, since it required more time to tell us what to do than it took to do it himself.

But at last his task was completed and he began talking into the microphone. Within a few minutes he was answered by a voice in his own language. He was delighted beyond all description as he began a conversation with this unknown person somewhere on his own world.

When the conversation ended about an hour later, he tried to tell us something. Miss Brewster interpreted him as saying that his friends were coming, and we were all to leave the cave together in a lunar ship and go to his people on the other side of the moon. Thinking it foolish to take all of our supplies with us, we each packed a hand-bag with some extra clothing, tooth-brushes and shaving outfits and waited for the arrival of the lunar ship. Dr. Haverfield said that it would take some time for the ship to arrive, since it would probably have to come from a distance of half-way around the moon. He told us that it was of the utmost importance that we dress in our best for our first appearance among a strange people. Baklo was surprised and amused when he saw us lather our faces and shave. He showed his own face which was as smooth as that of a woman. There was no evidence of a beard, so shaving was unknown to him.

Every few minutes he would go to the microphone and speak a few words, but it was several hours before he received the expected message that filled him with excitement. He hastened to fill an extra lamp and carry it to the entrance of the cave. This was a crude sort of a beacon to guide the rescuing party to the cave.

It was now about twenty-four hours after the lunar sunset and the night was very beautiful. The earth was but little more than half full and it occupied the same place in the sky that it had ever since our arrival. Its diameter was about four times that of the moon

as seen from the earth, and it appeared much brighter than the moon had ever done. Because of its larger size, the earth at this phase was flooding the surface of the moon with a soft light about eight times as bright as moonlight. The night was cool and pleasant; the thermometer registered sixty degrees, which was quite a contrast to the intense heat of the lunar day.

The sky was as black as it had ever been during our journey through space; the stars looked like millions of diamonds set in a sea of ebony and the constellations were exactly the same as they had always been when seen from the earth; although each star was much brighter and had forgotten how to twinkle. But the most beautiful object in the heavens was the earth. No land was visible, nothing but clouds and water which we thought a part of the Pacific Ocean. The clouds only added to the beauty and the brightness; but one spot of the unclouded surface seemed to be afire! This incandescent spot in mid-ocean, just north of the equator, was almost blinding. Dr. Haverfield said it was a reflection of the sun's rays; a small image of the sun, mirrored in the waters of the spherical surface.

CHAPTER XI

Destruction of the Cave

WHILE we were admiring the beauties of our world, Baklo sighted the lights from the ships from his own world. Frantically waving his torch, he attracted their attention and they signaled in return. There were five spherical ships, which were now quite visible in the "earthlight". The largest was fully two hundred feet in diameter, while the others were but a little smaller. They traveled in an orderly formation, the largest occupying the position of honor in the center. Their formation resembled that of four soldiers conducting a military prisoner to his execution. They were propelled by some mysterious unknown force, and were as silent as the rocks around us.

When they had approached to a point above us, they stopped and the largest sphere settled slowly to the ground. Searchlights from the four spheres above were turned on us and we now heard excited shouting from each sphere.

"This must be the welcoming committee," said Dr. Haverfield: "It did not seem strange that our departure was celebrated when we left home, but this is quite a surprise. I do not see how I can make a speech to someone who does not understand our language, but I don't see how I can get out of it."

"Zerko Baklo telo ka doonel! Zerko Baklo telo ka doonel!" came the shouts from the spheres.

"What are they trying to say?" asked Dr. Haverfield.

"It sounds to me as if the cheers are for Baklo instead of us. I can distinguish his name, but that is all I can understand. Probably you had better save that speech of yours until it is asked for, Dr. Haverfield," I answered.

At last the cheering came to a stop and Baklo addressed them in a loud voice. We could not understand his speech, but instead of cheers when he had finished, there was nothing but silence. Soon we heard a loud voice giving orders. A door of the lower sphere opened and Baklo conveyed the idea to us that we were to go inside. He then hurried back to the cave and closed the heavy stone doors at the entrance and joined us in the sphere. He then closed the door through which we had entered and we found ourselves alone in a single room that had no doors leading to any other part of the sphere. The only entrance or exit to our room was the glass door leading to the outside, and a glass window in the floor.

The sphere now rose to a height of several hundred feet and remained suspended in midair, in the midst of her four escorts. Powerful lights from all the spheres were trained on the entrance of the cave we had just left. Another powerful beam was directed toward the massive doors and a smoke began rising from them. The stone soon became red-hot under this powerful beam. This ray of heat was then directed to the ground for hundreds of feet around the entrance, which was now heated almost to the melting point. Another, more powerful beam was directed to the rocks high above the entrance, which were melted and allowed to flow down over the stone doors, hiding them completely under a mass of molten rock.

This did not meet with my approval at all: because there were several things inside that cave that I wanted and now there were no possible hopes of ever getting them. We had but two small cartons of cigarettes and three men who smoked. When our supply was exhausted, the results would be terrible.

When the work of destruction was completed, the fleet rose to a height of about three or four miles and began moving swiftly toward the west. We soon entered daylight and the speed began to increase. Looking out the windows, we saw the surface of the dead world moving along below us. Miss Brewster pointed out several familiar objects, but within a few hours, we were in a region with which she was not familiar, the side of our satellite that is never turned toward the earth. To one who knew nothing about lunar geography, no difference could be noted between the two hemispheres; but Miss Brewster was delighted with the new scenery.

The earth was now below the horizon and the sun was far in the opposite side of the sky. We had traveled almost half way around the little world. As the sun neared the horizon, our speed was checked and the fleet came to a stop before we entered the shadow of the moon.

We soon received the strangest vision that ever met human eyes. If our ancestors before the days of Columbus could have seen it, they would have said that they had come to the edge of the world. The rocky surface came abruptly to an end. Far below, in Stygian darkness, nothing could be seen. The spheres remained suspended motionless in midair for several hours, waiting for the sun to rise high enough in the sky to illuminate the great abyss below us. The shadows shortened slowly and soon we saw something below us that looked like an ice-covered lake.

That was exactly what it proved to be, a lake that froze to a great depth during the long night and probably boiled during the long day. We were of the opinion that there was a city down there in which Baklo's people lived. Since all craters on the moon are circular in form, Dr. Haverfield advanced the idea that this depression was circular also and was probably a thousand miles or more across. We could make no estimation of its depth, as we could now see far beyond the frozen lake, another vast abyss becoming visible under the rays of the rising sun.

The spheres slowly began to descend to the bottom and soon another plain, far below the level of the frozen lake, came into view. It was covered with

evergreen trees, planted in rows like an orchard; it was very beautiful under the rays of the rising sun. At last the spheres settled above a great hole about a thousand or more feet in diameter, probably of artificial origin. The walls were marble, which was now illuminated by strange lights, making it look like a terrestrial landscape on a cloudy day. One by one, the spheres entered this tunnel and we traveled for hours before our sphere finally stopped and Baklo signaled us to get out.

Prisoners!

BAKLO led the way through a beautiful marble passageway to a room made of the same material, fully two hundred feet square. When we entered this room, the door behind us closed of its own free will and none of our efforts could open it. We were prisoners! But for what reason?

As I recalled Miss Brewster's story of seeing Baklo marooned on the desert sea-bottom, the thought came to me that he was a professional criminal and his abandonment had been a legal punishment. When he called to them over the radio, they had probably decided to imprison him as well as his companions until they could decide what to do with him. He appeared to be highly pleased by his imprisonment; but there are a certain class of people who really enjoy being in jail. No doubt, Baklo belongs to a class similar to that. At this time, he is the only Selenite we have seen; when we see the others, they may be as much superior to him as he seems to be to us. If that is the case, what will be their opinion of us?

We were all very sleepy, but did not trust ourselves to go to sleep. It was decided to let Lacey stay awake while we slept, but he promised to call us if anything unusual developed. When Baklo saw us sleeping, he came to us with a box full of some drug resembling aspirin. Following his example, we each swallowed one and the effect was marvelous. We were no longer sleepy, but felt as if we had just finished a good night of restful and natural sleep. Here was something very great indeed; why waste time sleeping when one can get refreshed in so short a time? Winters said there was a fortune in that prescription for the concentrated sleep tablets, if we could get back to the earth with it. Miss Brewster said she had seen Baklo using this drug when he was struggling with his burden on the Sea of Serenity four years before.

The food served us was a prison diet if there ever was one. It consisted of water and a dry cake that was very flat and tasteless. It proved to be very nourishing, but I disliked it from the start; and now, after three months with nothing else to eat, I hate the sight of it and eat it only to keep from starving. Our cigarettes did not last very long; Lacey, Winters and I are almost ready to commit murder for a smoke. Fortunately for them, Dr. Haverfield and Miss Brewster have never smoked, and are spared the suffering of being without the soothing effects of nicotine.

Every few hours Baklo talks with some one by means of the radio, but we have no idea of what it is all about. There is a small screen attached to the radio in which we can see the face of the person to whom he is talking. It is some sort of a television apparatus, but it does not look much like the television sets of the earth. There is another device located in our prison, which we believe to be a television sending device; but of this we are not certain.

Miss Brewster is learning the Selenite language, but the rest of us are not making much progress with it. I have studied several foreign languages in school. I never mastered them, but they were easy to learn compared to this outlandish lingo of the moon. There is nothing about it that compares with any language of the earth. Miss Brewster is working as hard as she can to learn the language, but the rest of us do not have much of a chance, as she monopolizes all the instruction.

To pass away the time, I have written this brief account of our voyage; but it is doubtful if it will ever be read. These Selenites can not read it, and it is doubtful if they will let us return to the earth with it. It is now complete, up to date and I must wait for something else to happen before I can write any more. We have lost all reckoning of time. There is no day and no night here; everything is always illuminated by that strange light, whose origin we can not find. There are no light bulbs, no flames, no visible source of light, but the entire room is as light as the great outdoors of the earth on a cloudy day. Dr. Haverfield says the lighting system is perfect. It probably does seem so to one who is not suffering for a puff of smoke from a Camel.

Adjoining our large room, are several smaller rooms which seem to have been cut out of the solid marble. These are used as our private rooms. Another room in which there is running water, we use for a lavatory. But in the ceiling of the large room (or Bull-Pen, as I call it) there is an outlet. In the exact center of this outlet, there is a small luminous object that is continually sending off small sparks. I believe that, if I can get past it and follow this passageway to its end, it will lead out of this accursed place. I have reached the point where I am willing to risk anything to get out. Our last safety-razor blade was discarded three weeks ago and we men from the earth are running around here with beards that are a disgrace to civilization.

Miss Brewster is the only one of our original party who is perfectly contended. She and Baklo are together continually and they enjoy the company of each other very much. He tells her that marriage is not the same kind of an institution that it is back home; and certain difficulties must be overcome before they can ever marry.

PART THREE

The Narrative of Dr. Wm. H. Haverfield, A.M., Ph.D., President Emeritus of Belmont University.

Soon as the evening shades prevail,
The Moon takes up the wondrous tale,
And, softly, to the listening Earth,
Relates the story of her birth:
While all the stars that round her burn,
And all the planets in their turn,
Confirm the tidings as they roll,
And spread the truth from pole to pole.
—Addison (1672-1719).

CHAPTER I

In Prison

SINCE our return to Mother Earth, I have been constantly besieged by the gentlemen of the press for a detailed story of our visit to our sister world, the Moon. A number of garbled accounts have

already been published, which we have not yet had the opportunity to confirm or deny. The purpose of this manuscript is to correct any erroneous impressions that may have been given to the public, as well as to prevent these false reports from hindering the great work just ahead of us. It is generally known that we have had communications with the administration at Washington, the nature of which will be revealed as soon as the public learns enough of the facts to form an intelligent opinion.

This narrative is being written for the general public; but, in the near future, I hope to release a number of articles for the scientific world. Volumes can be written on the subject of Interplanetary History but in this manuscript I expect to incorporate only a few of the most vital events, which have had a direct influence on our entire race, as well as a direct bearing on our story. Lunar science makes our own look like the work of amateurs. Terrestrial scientists have done but little more than penetrate the surface of such subjects as chemistry, surgery and countless other scientific subjects. The music of the Lunarites can put our greatest symphonies to shame, while their mechanical achievements make our modern factories look like a blacksmith shop of fifty years ago. I can not hope to give all these things a deserved description in this manuscript; they are merely mentioned here to give the reader an idea of the greater things to come.

Only three of the five passengers of the *Astronaut* have returned: Cyrus Lacey, Lester Winters and the writer of this narrative. Miss Dorothy Brewster did not choose to return. Her many friends and admirers will be pleased to learn that she is now married to a certain handsome young Selenite, of whom you have already heard. They will also be glad to join with the Selenites in wishing this couple all the happiness in two worlds.

But the greatest surprise we have to offer concerns George L. Davis. Those who enjoyed his writings while the *Astronaut* was being built, as well as his story of the actual voyage, may think it strange that he had no desire to return to his native world. But the reason for this decision, announced just as preparations were being made for our return, is easy to understand. The young man is in love, but that is not the excuse he gave for not returning. He wants to finish the course of studies prescribed for all the young men and women of the moon, before they are qualified for citizenship. Furthermore, he is expected to translate a certain terrestrial literary production into the language of the Selenites at once, and to work with me in a great task to be described later in this narrative.

In the last paragraphs of his narrative which I have read, he told of his dissatisfaction with the food and treatment received in what he described as a prison. His greatest complaint was caused by an abnormal desire for a cigarette. Lacey and Winters were also suffering for cigarettes; but because neither Miss Brewster, Baklo nor I used tobacco, we sympathized with the boys but could not feel their pain.

At that time our knowledge of the Selenite language was inadequate to understand Baklo's attempts to explain the purpose of our confinement. Davis had the impression that we were being treated like criminals and was filled with possible plans for escape. But even though we could not understand Baklo, we could see that as long as he was satisfied, there was no cause for alarm. After Davis had completed his manuscript, his enforced idleness caused his nervousness and restlessness to increase. Our efforts to cheer him up failed and, for a time, it began to look as though he might lose his mind.

In the ceiling, of our underground prison, was a ventilator for the outlet of foul air; and in the center of this ventilator, there was a small luminous object, the nature of which we could not understand. Davis thought we could escape through the tube of the ventilator and fight our way to freedom. We did not approve of the plan, while Baklo tried to warn us to keep our distance and let this mysterious thing alone.

Davis ignored the warning and attempted to make his escape alone. He received a severe burn from this luminous object; which not only put a stop to all plans of escape, but almost resulted in the complete loss of his right arm and hand. Baklo communicated with unseen friends by means of a device answering the purpose of a telephone, and obtained the necessary remedies for Davis' burns. But it was not until our release, and after Davis had received the services of the skilled Selenite surgeons, that full recovery was possible. Upon our release, he was taken to a hospital and was separated from us for some time while taking the treatment that finally resulted in his complete recovery.

Under Observation

SOME time after the injury of Davis, Miss Brewster explained that she and Baklo were making a Selenite-English dictionary, for the purpose of better mutual understanding. Her task was a difficult thing to do, inasmuch as the two languages have nothing in common.

Miss Brewster would speak an English word and, by means of gestures, explain its meaning to Baklo, who would give her the Selenite word for the same thing. She would then write the word and spell the Lunar equivalent in English characters. Baklo would then write the same word in his own language, and spell the English word in Lunar characters. They spent their entire time at this task during the period of our imprisonment, or as I should say, the period of our quarantine.

To keep up our morale during our quarantine, we often sang; among our favorites was "Over the Hills Comes the Sunrise." We had a lot of fun teaching Baklo to sing it in English. And in spite of his difficulty with a certain high note, he never seemed to tire of it. While the two were working on the dictionary, when either showed signs of tiring, this song revived them and made their work a pleasure.

As soon as they could understand each other enough to carry on a conversation, Baklo explained the purpose of our confinement. In the remote past, the Selenites had made voyages to the earth and discovered in our atmosphere as well as everything on our planet a strange form of life—bacteria—disease germs of countless varieties. By sad experience, they had learned the effect of these organisms on the human body and were determined to keep them out of the Selenite world, which was entirely free from all kinds of disease. When news of our arrival reached them, they feared that we had brought with us all manner of loathsome diseases. The spheres, which had been sent to rescue us, were ordered to close up the entrance of the cave in Mt. Despair, and use a heat ray to destroy any bacteria that might be present in the vicinity.

In order to keep us isolated from the Selenite popu-

lation, we had been brought to our present quarters in a separate cell of the sphere. The machine that had been the undoing of George Davis was a sort of a death-ray, designed for the purpose of applying heat to all forms of life that came within a certain radius, and thus destroying them. It was situated inside the outlet of the ventilator, for the purpose of killing any microscopic organisms that might escape from our bodies, as they left the room with the foul air. The air that we breathed did not enter the room through a ventilator of the terrestrial kind; but was manufactured from a liquid by another peculiar machine within the room. An odorless chemical which acted as a disinfectant was mixed with the air; as we breathed this preparation, our bodies were cleansed of all disease germs. This process could not be completed within a few hours, nor a few weeks. In fact about twenty lunar days, or nineteen terrestrial months, passed before we were permitted to leave our quarters. By this time Dorothy and Baklo could converse quite freely, and the rest of us had a working knowledge of the Selenite language.

Every move we made during this time was observed by scientists studying us by means of radio and television. Lunar microphones picked up every sound we uttered; and we were surprised to learn, upon our release, that certain Selenites could use our language almost as well as we could use theirs.

Our clothing had been replaced, as fast as it was worn out, by new garments of the same color and pattern, although the material was not the same. We learned later that it is made from some synthetic fibre, of which they have several varieties, ranging from a silky cloth, fine as a spider web, to a coarse canvas, too tough to cut with an ordinary knife. Their own garments are somewhat similar to our own, but no time will be taken in describing them, because no two Selenites dress exactly alike. Several volumes could be filled with descriptions of their styles and manner of dress and still there would be enough left over to keep the designers of New York and Paris busy imitating them for years to come. On the earth, it is seldom that one sees two women dressed exactly alike. On the moon, the men are just as fastidious; and the Selenite women are even more so.

Our food, as George Davis has described it, was nothing more than a flat, tasteless cake, very unsatisfying to the palate, but highly nutritious. Small cakes weighing scarcely two ounces for each of us, wrapped in thin paper, came down a small chute at intervals of about six hours. These cakes contain in its correct proportions what their scientists consider to be every element required by the human body.

Rejuvenated!

BAKLO explained that we would be expected to undergo a surgical operation as soon as we were removed from our quarters. He said that all of our bodily organs would be completely overhauled, certain detrimental glands removed and foreign growths substituted; which would prevent aging and wearing out of the tissues, and keep our bodies in a youthful condition. As a result of these operations at certain intervals, as well as from correct diet and the absence of detrimental microbes, the life of the Selenites is from 900 to 1400 years, unless they meet with accidents.

I shall not describe this operation, because I know nothing about it. We were unconscious while it happened, and were kept in a state of suspended animation for a period of three lunar days afterward, while we were recovering from the effects of it. When we were permitted to come to our senses, we felt entirely well in every way. Though I am but fifty-six years of age, I was considered old when we left the earth; but, after this operation, I looked and felt like a youth of eighteen or twenty. My gray hair had disappeared and a new crop of blond hair, such as I had in my youth, was growing on my head, including the spot that had been bald for over twenty years. Our beards had disappeared and our faces were as smooth as that of any woman. Since this operation, it has not been necessary to shave.

We had found the mythical "Fountain of Youth," for which mankind has longed for centuries. I can not describe my emotions, when I came to my senses and found myself again young in body and still old in experience. I had reached the point in life where I considered myself almost no longer useful. I now thought I was better equipped to do things than any of my fellow earthlings. How I longed to return to Belmont and take up my duties where I had left off. I would be the envy of all my old colleagues, who were facing the day when their age would disqualify them for further usefulness.

I could see a distinct change in my personality. I had taken pride in the dignity of age. I was now a young man with the prospects of a long and promising career before me. In my new life, I would be able to foresee many mistakes and dangers that had caused me considerable trouble in the past and I could scarcely wait to get back home and begin my life anew. Thoughts and dreams of my youth, that had long been abandoned, returned to my mind. Mischief and boyish pranks were trying to gain supremacy over my habits of age and dignity; but my former experience told me which emotions should be suppressed, and which should be cultivated.

It was our desire to travel and explore the many mysteries which were evidently to be found on this little world. When I explained this wish to Baklo, he told me that plans had already been discussed, and probably adopted, for our entertainment and education to qualify us for citizenship.

"But we do not care to qualify for citizenship; we have no intentions of spending our lives here. We want to return to the earth, just as soon as we have seen the wonders of your world," I replied.

"How do you intend to make the return voyage?" he asked.

"In the *Astronaut*, the rocket in which we came. With the aid of your mechanics, it can be reconditioned for the return trip."

"Your *Astronaut* is completely destroyed. Everything you brought with you, with the exception of those supplies which we carried into the cave at Mt. Despair, was destroyed by our heat rays. It was decided to take no chances of your bringing disease to our world."

"But you can help us to construct another rocket," I replied.

"Yes, we could do that, or we could give you one of our own space flyers; but we have no intention of doing anything of the kind."

"Why not?"

"That will be explained to you in due time; probably before the day passes. An interview with our Zerko and the Buzerks is being arranged for you."

"What is a Zerko and a Buzerk?"

"A Zerko is the supreme ruler of our world. A Buzerk is elected by a smaller group of 100,000 citizens as their sub-ruler. The Buzerks are also advisors and assistants to the Zerko. They meet with him when he calls them, and together they make plans and laws for the welfare of the citizens. Each Buzerk has a number of assistants who see that the laws are obeyed in his community," he explained.

"Why are we to meet with your Zerko and Buzerks? What do they want with us?"

"That is for them to tell you. Zerko Tarkomas has commanded his Buzerks to meet in the council chamber; and we will go there to meet them just as soon as their preliminary conference is ended."

"What sort of a person is Zerko Tarkomas?"

Baklo Revealed

BAKLO smiled as he answered: "Zerko Tarkomas has been our ruler for almost five hundred years. If he lives ten years longer, according to our ancient laws, he must abdicate the throne to his lawful successor. No Zerko can reign for more than five hundred years. The reign of Tarkomas has been distinguished by arousing the citizens to a greater interest in science. Narratives and fiction have long been popular, but science was considered mental drudgery by many. Tarkomas combined fiction with science and made the study of the latter a pleasure. He induced writers to produce this type of literature; but does not permit them to use anything but correct scientific principles, although there is no limit to imagination in the fictitious element. Scientific principles learned in this manner remain long after the story is forgotten and as a result, the entire population has developed a greater desire for scientific knowledge than has ever existed in our history. With a scientific populace, our progress has been greater during his reign than that of any other period during the last quarter of a million years.

"Tarkomas is loved by all his people, and it is with regret that they see his reign draw to a close. But it may surprise you to learn that Zerko Tarkomas is my father and I am heir to the throne.

"Medo, my uncle, had visions of acquiring the throne. I stood in his way; so he planned to have me kidnapped and killed. He used his influence to release a number of criminals, who promised to assist him in his plans. As a result, I was kidnapped and marooned on the desert, which you call the Sea of Serenity. Dorothy saw them leave me with a small amount of provisions, to prolong my suffering, before I should die from exposure to the hostile forces of Nature. I determined to use every ounce of power I possessed to defeat Medo's plans and bring him to justice. Dorothy saw me struggle across the desert to the cave in Mount Despair, and you know the story of my rescue.

"After our return and the story of Medo's crime was made known, he was punished. It was solely through the efforts of his brother, Zerko Tarkomas, that he was not put to death. The reign of Tarkomas has been entirely free from this sort of punishment; so it was decided to place him in solitary confinement until I succeed my father on the throne, when it shall be my duty and privilege to pronounce sentence. It had been my intention to deal severely with him; but Dorothy has convinced me that no pleasure can come to me through his suffering.

"Although he did not know it at the time, Medo has done me a great favor. As soon as I was given up for dead, he married my wife; this makes me free to select a wife of my own choice. The Supreme Council has the power to select the wife of the heir to the throne, in order to keep our finest blood in the royal family; but they are entitled to dictate only one choice. Her marriage to Medo makes me free; but the Supreme Council must approve the second marriage. As you no doubt suspect, Miss Dorothy Brewster is my choice; but the Supreme Council does not favor a woman of an inferior race as the Queen of Dunel. It remains to be seen what the result will be."

"Who said Dorothy Brewster was of an inferior race?" I asked in indignation.

"That fact can not be denied. Our race has been civilized for over a hundred thousand years; but your own can not boast of a written language in your entire world that is more than five thousand years old."

"Does that imply that we are of an inferior race?"

"Intellectually, it certainly does. Physically, there is a question; our powers of endurance are greater than yours, but your muscular power is greater than ours. But for that matter, we have animals that have more powerful muscles than ourselves; except in sport, muscular power does not mean much on Dunel."

"That may all be true, but I do not enjoy hearing our race spoken of as inferior to any other. I'll tell your Supreme Council a few things if they insult us like that. Dorothy Brewster is good enough for anyone and I'll prove it to them if I ever get the chance!"

"You had better control your emotions, my friend. The Supreme Council is very powerful, and there are some among them who favor destroying you because of the warlike tendencies of your race. Any outburst of anger on your part may prove disastrous to your entire party. My father and all the citizens of Dunel are very grateful to you for rescuing me. They will do everything within their power to repay you, provided you are not considered dangerous to our people. I assure you that I will do all that I can for you; but as the future Zerko of my people, I owe everything to them. Anything that I do must be done for the best interests of my own world."

* * * *

It was some time later that Dorothy came to me with the message that our entire party was commanded to appear before the King of Dunel, within a period of four diros.* We were to assemble at our former prison and be conducted to the Council Chambers.

At the appointed time and place, we were met by Baklo, who informed us that he was to conduct us to the Council Chambers. He and Dorothy led the way through a long passageway for almost half a mile, after which we entered an elevator and rose to another level, about a thousand feet higher. After a short wait, there arrived a car which resembled a small street car, although it was suspended from a single overhead track. This car, we later learned, is the equivalent of our own passenger trains, used only for long-distance travel. But on this occasion, since there was royalty in our party, we were the only passengers.

* See Next Page, footnote.

After traveling for about three hours through an illuminated tunnel, the car came to a stop. Then we entered another tunnel and descended to a much lower level. After a short walk through beautiful passageways, we entered a small anteroom and were directed to sit down on a marble bench, carved from the solid marble wall, and wait until we were asked to enter the royal presence of the king.

CHAPTER II

The King of Dunel

THE Council Chamber was a large, palatial room, almost circular in shape, about 150 feet in diameter. It had the appearance of being carved out of a solid block of marble. In the center of the room was an enclosure about twenty feet in diameter, with a marble railing around it; within this was a large marble table, around which a small group of men were seated. At the head of the table was a man with a purple robe about his shoulders. There was about him an invisible something that gave him the appearance of being very old and at the same time despite his white hair quite young. He was the very personification of dignity and power; his features reminded me of a marble statue of a Roman emperor I had once seen. This was Zerko Tarkomas, the King of the Moon and the father of Baklo, who now took his seat at the right of his king.

The other men at the table were his most intimate advisers, or as we might say, the Cabinet. Outside the central enclosure, in circular rows of seats, were the Buzerks, men who were now acting as a parliament or congress; though, outside the Council Chambers, their office was comparable to that of a governor or mayor, for each was a ruler over a community of approximately 100,000 citizens. The seats at the end of the table in the center were reserved for us. I was directed to the middle seat, with Miss Brewster at my right and Lacey and Winters at my left.

Baklo was the first to speak. As he rose to his feet, cheers and applause sounded throughout the hall. This was his first appearance in the Council Chamber since his abduction almost six years before. When the cheers finally ended, he made a short address; which I shall not attempt to repeat because I did not understand half he said. As his speech came to a close, he asked each of us to rise to our feet and be introduced to the Supreme Council. Loud applause greeted each of us as we were introduced; but as Miss Brewster rose to her feet, the cheers and applause became a deafening roar. This was her first public appearance before the Selenites, and the enthusiasm with which she was greeted will be remembered as one of the outstanding events of my life—even if I live to be a thousand years old.

When the applause finally ended, Baklo spoke to us in English. He first introduced his father, Zerko Tarkomas, the ruler of the entire moon. The cabinet was then introduced separately; but, since there were one thousand Buzerks assembled, they were introduced *en masse*. Baklo then explained that the purpose of the meeting was to give Zerko Tarkomas an opportunity to interview the guests who had entered his world. This was the first time in Lunar history that visitors from another planet had thrust themselves upon this peaceful world; and it was only natural that we should be interviewed by the Zerko, in the presence of the Supreme Council.

The interview was rather difficult, as neither the Zerko nor his visitors could speak each other's language. Dorothy and Baklo acted as interpreters and neither was completely master of the language of the other. At times, it was necessary for them to hold a private consultation of their own before a sentence could be correctly interpreted. This interview was rather lengthy; when Lacey and Winters read it, they will say that I have hit only on the high places.

"My son tells me that you have come from our neighbor world, which we call Barlenkoz.* Why did you come here?" This was the first question from Zerko Tarkomas.

"We came to test our invention, the astronautical rocket, and to search for knowledge regarding our satellite. Miss Dorothy Brewster had learned that your world had an atmosphere and was capable of supporting life; but we others did not know until our arrival that there was a race of human beings here. Miss Brewster proposed and financed the expedition for the primary purpose of rescuing your son, whom she had seen marooned on the desert; but we never knew or suspected this until Baklo was introduced to us."

"You say you come to search for knowledge regarding your 'satellite.' What is a 'satellite?'"

Dorothy and Baklo, after a consultation of their own, supplied the definition, which did not seem to meet with the approval of the Supreme Council.

"Is it your custom to regard our world as a small body, with no other excuse for its existence than to run in little circles around your big Barlenkoz?"

"No scientific theories have ever been formulated concerning the purpose of the existence of your world; the only purpose it has ever served for us is to furnish reflected light to our world at night. Our scientists believed your world incapable of supporting life until Miss Brewster made the discovery."

Without knowing it, I had insulted the moon, its king and all of his subjects. I should have known that any intelligent man is patriotic enough to love his country and his own world; this unintentional insult at the beginning of our interview was a very thoughtless procedure.

"I feel that it is my duty to inform you that our world does not run in circles around yours; the two revolve around their common center of gravity. Since Barlenkoz has stolen our oceans, and even our original atmosphere, it is doubtful if your race could endure on our world for even one dirdir! They could not

* "The Big Menace."

* The Diro (see preceding page) is a unit in the measurement of time. Its value can be obtained from the following table in which the approximate terrestrial equivalents are given.

Ten Moodirs make one Soldir, which is equivalent to 2.36 terrestrial seconds.

Ten Soldirs make one Kindir, which is equivalent to 23.6 seconds.

Ten Kindirs make one Isdir, which is equivalent to 3 minutes, 56.06 seconds.

Ten Isdirs make one Dir, which is equivalent to 39 minutes, 20.6 seconds.

Ten Dirs make one Diro, which is equivalent to 6 hrs., 33 min., 25.9 seconds.

Ten Diros make one Dirumo, which is equivalent to 2 days, 17 hrs., 34 min., 19.1 seconds.

Ten Dirumos make one Dirdir, which is equivalent to 27 days, 7 hrs., 43 min., 11.04 seconds.

One dirdir is the moon's sidereal period, the lunar day.

The number of dirdirs in the year is not constant, as the value of the year varies. Generally speaking, a lunar year is equivalent to one terrestrial year, but the Selenites estimate the value of the year as the time required for the moon to make one complete journey around the sun, irrespective of her position in her orbit around the earth. Fifty lunar years will average the same as fifty terrestrial years, but each separate year may vary to the extent of several terrestrial days or half that number of dirumos.—W. H. H.

"I am sorry I did not give your world the respect to which it is entitled. But our people are very ignorant as to conditions here; I merely gave you the popular terrestrial conception of Dunel. I am indeed sorry and offer you my apologies."

The Zerko Denounces

"WE will forgive you; but please remember that we love our little world and our people feel a deep and deserved hatred toward Barlenkoz. Let us proceed: Do your friends know that you arrived here in safety? Have you communicated with them?"

"Unless our arrival was observed from the Brewster Observatory, where the only telescope of sufficient size is located, they know nothing of our arrival. Our radio is useless at that distance, hence communication is impossible."

"If it were known that your voyage was made in safety, would others follow?"

"I believe they would."

"For what purpose?"

"Exploration and adventure, to search for rare minerals and probably to make their homes here."

"What do you mean by adventure? Would they make war upon us?"

The seas soon left their beds and condensed into one huge tidal wave that swept around the little world as it turned on its axis.

endure for one isdir, if it were not for the protection given by the superior intellect of a greater race!"

Zerko Tarkomas was making an attempt to control his rage; but the insult had been too great.

"No war will be made without cause. Our government never makes war until forced to do so."

Tarkomas spoke a few words to an attendant in his own language. The attendant left the room and soon

returned with a globe of our earth, done in bas-relief, showing all the physical characteristics of our planet but, of course, no political boundaries.

"Show us where your country is located," he asked.

I showed him the portion occupied by the United States of America.

The king gave an order, and the attendant carried the globe around the room, giving each Buzerk a chance to see the country designated. Some shook their heads in doubt, while others cast evil looks at us.

"We can not believe you," Tarkomas said when the examination of the globe was complete. "Our latest exploration of your planet showed your race to be living here,"—pointing to the northern half of Europe: "The men who lived where you designated were of a reddish brown color."

"When did you last explore our planet?"

"Our last exploration was made during the ninth year of my reign, that makes it 481 years ago. I led the expedition in person, as that is one of the first duties of a new Zerko."

"Many things have happened on our world since you last explored it. The wild red men no longer inhabit the smaller hemisphere. The white race has made wonderful progress and showed their supremacy in every part of our globe. If you were to explore our planet today, you would not recognize it."

"What has become of the red men?"

"Most of them were killed in the wars with our ancestors, who made colonies and settlements in the newly-discovered continent. The red men attempted to drive them out of the country but, in the wars that followed, their power was broken."

"Do you call that progress?"

"They were a barbaric, decadent race and we have developed the country to an extent they could never reach."

"Did that justify your killing them off?"

"They would not be peaceful; it was our lives or theirs and our fathers simply applied the law of self-preservation, the survival of the fittest. Our safety depended upon their destruction."

"And you told me that you never made war without cause! The mere fact that you wanted to make colonies in a foreign land and take possession of it seems with you to justify war. If you wanted our world, you would do the same thing here. You said that the safety

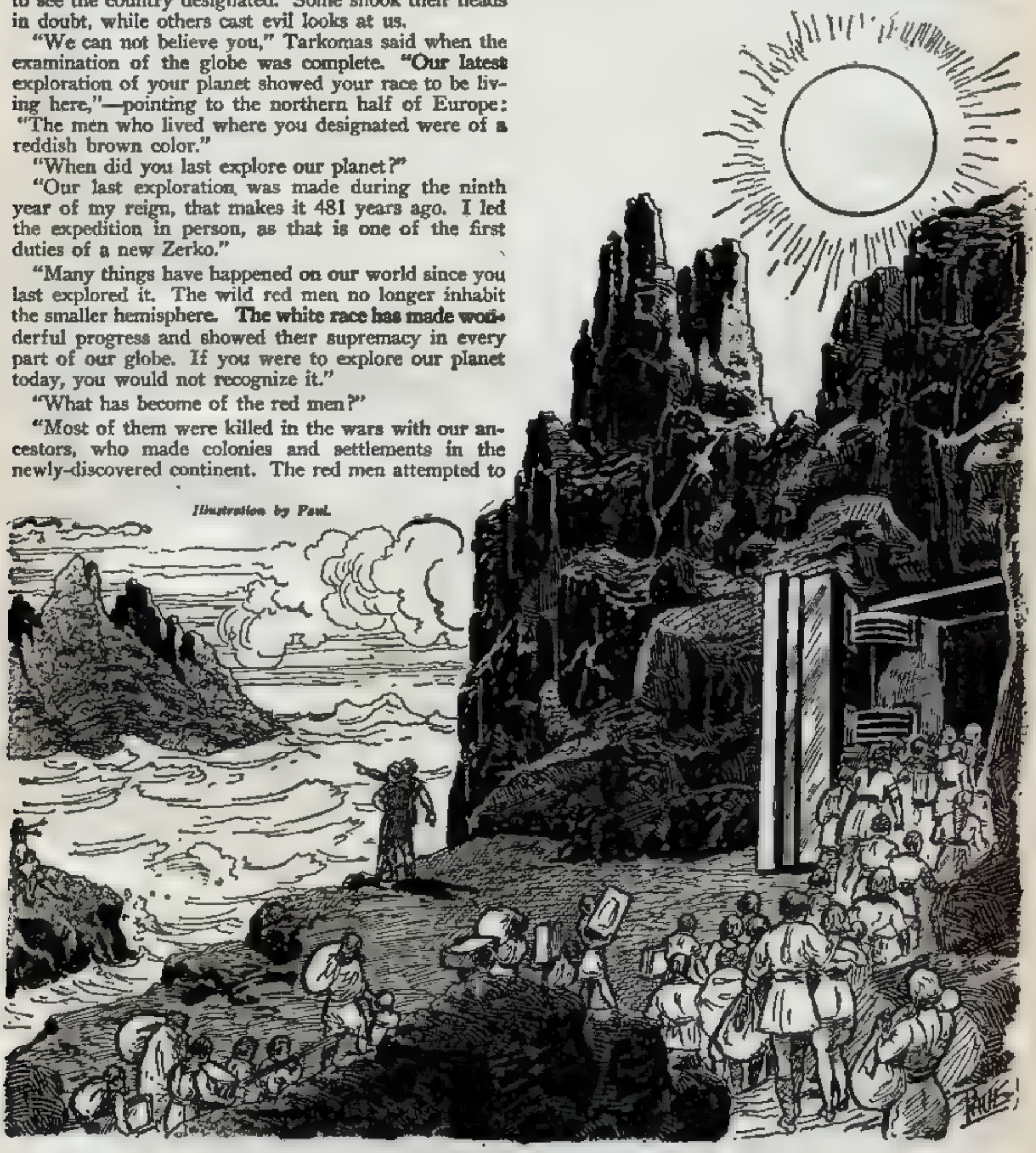


Illustration by Paul.

of your fathers depended upon the destruction of the red men. Our safety depends upon keeping your hordes of people from trying to invade and colonize Dunel. Our first step shall be to prevent your party from ever returning to tell your people that ours is a desirable land that can be reached in safety. You are a barbaric race yourselves; war and wholesale murder have been the most prominent things we have witnessed on your planet, each time we have explored it in the past. Applying your process of thinking, what did you call it? Er-er—'the survival of the fittest,' that's it: applying that system our safety depends upon your destruction. If we decide that it does, we have the tools necessary to accomplish it within a very short time. But you spoke of progress. Tell us what progress you have made during the past five hundred years."

I described the early voyages and explorations of that period, together with the inventions that marked the beginning of the modern era. I told of our recent inventions, development and progress. I described our railways, oceanic commerce, aviation, as well as the recent inventions and scientific discoveries such as the X-ray, radio, television and everything I could think of to show him that we were not an entirely warlike people, but an intelligent and progressive race. When I had finished, a titter of suppressed mirth was noticeable over the entire room, which finally burst out into loud laughter.

This annoyed me; but, at a gesture from the Zerko, the mirth of the Buzerks was suppressed. Turning to us, Tarkomas apologized for their conduct:

"My people evidently think your present condition is very crude, compared to our own. But they will not laugh so loud when I ask them if we have done as much during the same period. Comparing the conditions you have just described with those I observed less than five hundred years ago, I will say that no group of human beings, at any time during the last quarter million years, have done as much in so short a period of time. On behalf of my people, I congratulate you and express the hope that your progress continues unchecked. I now ask you to take this model of your world and tell me its history. Begin with your earliest records and tell me the story down to the present time."

The Zerko Is Surprised

I COMPLIED with his request, speaking in English, while Miss Brewster translated every word into their language. I began with the Genesis account of the creation and origin of man. I then explained the theory of evolution, that mankind had developed from lower forms of life. I described primitive man and the early civilizations of China, India, Egypt, Babylon, Phoenicia, Greece, Carthage and Rome. I told of the downfall of Rome and the Medieval European nations, out of which grew the modern world. I saved for the last, the glories of the greatest of the great nations. I no longer boasted of wars and conquests, but told of how we had developed the wilderness and established a nation founded on sound, lasting principles. I told of our work in awakening Japan, of our help to Cuba and the Philippines. I told of our part in the World War and of feeding starving nations. I described our schools and colleges, as well as our work in uplifting the Negro and Indians. When I had finished, I could see that I had made a better impression on my audience. This pleased me because I had used every ounce of oratory that I could command.

"You have good reason to feel proud of your country after comparing it with the mighty nations that have gone down in the dust; in spite of the fact that you have destroyed a noble race of red men in making your nation possible. Your ideas of your own origin are very amusing, and show the result of very clever thinking. There is truth in both tradition and conjecture; but it seems that your race has been unable to think in any terms other than pure Barlenkozian. Wait until you have learned the history of your race and ours; perhaps you have already suspected that they have the same common ancestors.

"I will now ask you to describe the living conditions of your people. Tell us of their manner of living, their homes and customs, in all the countries of Barlenkoz."

I gave a description of present-day home life as it exists in the various types of American families; the idle rich, the brain workers, the laborers and factory workers, the farmers, the city slums and the underworld lawbreakers. I then told of conditions in other countries as well as I could; of the crowded conditions in Asia and Europe and the uncivilized people of Africa and the South Sea Islands.

"What is the population of Barlenkoz?"

"About two billion."

This brought several whispers from the Buzerks; Zerko Tarkomas doubted my word. "Is that an actual fact, or merely a crude guess?" he asked.

"It is the truth. About half of the people of our world live on one continent—Asia; nearly one fourth live in China, which occupies the eastern part of Asia. Another quarter of the population live in Europe."

"Your population is too high; you outnumber us twenty to one."

"Yes; but have you considered the difference in the size of the two worlds?"

"I have. Did you consider that three-fourths of the surface of your world is covered with water, and your people all live on the surface? There are but few people on Dunel who live on the surface. Our most desirable homes are all underground. One hundred million is all that our world can support in comfort; our population is fixed by law and remains as near that figure as possible. Do you keep your population at the figure of two billions?"

"What do you mean?"

"Do you have a birth rate fixed by law?"

"No country of our world has ever attempted to regulate the private affairs of the people to that extent."

"Do you mean to say that they permit the private affairs of any individual, or group of individuals, to go unchecked when they are working against the best interests of the commonwealth?"

"There has been agitation for such measures lately, but they have made little progress."

"Are these countries with the large populations able to support their people in comfort?"

"No. Famines are common in Asia, and I have heard it said that there are people in certain countries,

who never have all they want to eat at any time during their entire life."

This brought exclamations of surprise from everyone in the vast council chamber.

"And birth control has never obtained a footing among the two billion people on your globe?"

"It has often been discussed and is secretly practiced; but it is forbidden by law to disseminate information about it."

"Is it practiced by certain individuals who should not do so, while others unfit to propagate the race continue to populate your world with undesirable offspring? Do your rulers and lawmakers make no attempt to regulate the matter?"

"That condition exists. Any laws made to regulate the matter would indeed be very unpopular and impossible to enforce. It would be absurd to ask any other nation to adopt such a law. If the United States of America were to limit our offspring, our population would dwindle; and we would be unable to keep the surplus of other nations from taking our homes from us. Our nation, in our estimation, is the best qualified to propagate the race, but we would find it extremely difficult in convincing other nations that we are."

But what will you do when another century has passed? Every part of your world will be overpopulated and unable to make a living."

"We trust to modern science to provide easier ways of producing the necessities of life and taking care of the needs of the people."

"Your scientists will no doubt arrive at the same conclusion that we adopted two hundred centuries ago; the birth rate must be regulated by persons with intelligence enough to do so. It was a very unpopular law when we first enacted it; but without it, this would be a dead world in every sense of the word. Every person of both sexes, upon reaching physical maturity, is given a slight surgical operation, which makes them temporarily sterile. This does not interfere with marriage or any of the pleasures connected therewith. But to become a parent is a privilege and a reward; to be given permission, and an operation making this possible, is a mark of distinction, to be granted only after the individual has convinced the proper authorities that he or she is worthy. It is only fair to inform your party that sterility was included in your recent operation.

"Since our lives average 1,000 years and the population remains at the constant figure of 100,000,000, we can expect 100,000 to die each year; and that is the approximate number of children to be born during the same period. The number of deaths each year determines the number of births for the next year. One child is born to but one couple out of five hundred each year. Approximately one hundred children are born in each community, under the jurisdiction of a Buzerk, yearly. Every Buzerk has a staff of assistants who decide upon the physical and intellectual qualifications of the hundred married couples to be given this honor. Parenthood is never forced upon anyone against their will; as there are always more applications than can be filled. According to the law of averages, each couple would be entitled to have two children during a lifetime; but some are given the honor as many as fifty times or even more during their life, because of acknowledged superior traits. On the other hand a large percentage remain childless, from either personal preference or the decision of the authorities.

The Council's Decision

"AT birth, each child becomes the property of the community, rather than of the parents. One hundred children each year enter the community nursery. This is not done to deprive the parents of the company of their children; but for the welfare of the child. Births occur at such rare intervals that, when the child arrives, the parents are ignorant as to the care it should receive. The mother, and often the father too, is permitted to remain with their contribution to society, for an optional period between one dirdir and ten years. After that time, the child spends a portion of his time with the parents; but his development, both physical and mental, is under the control of professional teachers and coaches. Physical maturity comes at the age of twenty-five; but mental maturity is not reached until his education is complete and he is ready to enter the world as an educated man, capable of doing his duty toward society, for the remainder of his life which, barring accidents, should be between 800 and 1,400 years.

"This system has developed a race of super-men, compared to those produced by the haphazard methods of promiscuous intermarriage and interbreeding such as you describe on your planet. Mental maturity is not reached until the youth is about fifty years of age. Until that time he is trained in the various arts and sciences; he is taught every subject in the curriculum, before he is permitted to specialize and learn any subject in its entirety."

"You have indeed a wonderful system," I told him: "At home, our young men complete their education between the ages of fifteen and thirty. The limit of one's finances usually decides the limits of his education. At fifty, life is almost spent. Only a few reach the age of eighty when they are incapable of doing much work."

"Yes; that describes our own conditions before science modified the laws of nature. That is all we have to ask you, unless some of the Buzerks have questions."

"What is the present condition of the black race on your planet?" asked one of the Buzerks.

I described the conditions of the negro in his native continent, as well as that of the typical American negro.

"Do any of your American negroes show signs of intellectual or scientific progress?"

"Only in rare cases. We have a few negroes of whom we can be proud; but I must confess that they are not given opportunities, either socially or any other, equal to those of our own race."

"If they were given the opportunity, do you think them capable of ever rising to supremacy?"

"No race will ever be our superiors!" I replied, trying to give my reply a double meaning.

There being no other questions to ask, Zerko Tarkomas continued: "You will now be conducted to the rooms that you have occupied since your arrival, and wait until we send for you. You will then know our decision, regarding your future. Have you any request to make before leaving the council chamber?"

"My only request is that we be permitted to return to the Earth when we desire it."

"Have the other members of your party anything to ask?"

"Yes," Lacey replied, "I'd like permission to return to the cave in Mount Despair and get some of the articles we left there."

"Do not build your hopes too high. I have no idea that either request will be granted." He then spoke to an attendant, who conducted us out of the room and the interview was ended.

After a period of one dirumo (2¾ terrestrial days) we were again conducted to the council chamber to learn our fate. We found everything as we had left it and were shown every courtesy as we entered the room and took our seats.

"Friends from Barlenkoz," Zerko Tarkomas began, "we have reached a decision as to what disposition to make of you. This is the first time in our history that anyone from Barlenkoz has ever been admitted to our world, and it has been decided that this shall also be the last. We realize that this is both selfish and discourteous; but we can not sacrifice our world or our race for the benefit of an inferior race of men. Hereafter, should any of your people come to Dunel, they will be destroyed without asking any questions, as soon as we are aware of their presence. If we were to permit a peaceful settlement of Barlenkozians at any point on our world, they would increase in numbers so rapidly that Dunel would soon be overrun with foreigners, and there would be no place for our own people. We will use every means at our disposal to prevent an invasion, be it peaceful or warlike, of germ-infested Barlenkozians.

"You are of a warlike race. Even though your own nation is peaceful at present, it is composed of the same blood as the other nations of your world. We are not convinced that you would never make war with us; a war between Dunel and any part of Barlenkoz is undesirable to us. We have no desire to wipe any race out of existence but, if we were invaded by hordes of foreigners, we would have no other choice. Our own safety would depend upon it.

"In your own case, circumstances are different. I owe you a great personal debt for restoring my only son to me, after he had been given up as lost. The people of Dunel are grateful because you have restored the heir to the throne. You have earned our gratitude; and you shall be rewarded with life and citizenship. Every effort will be made to extend the period of your lives to an equal of our own. We can not place you in the regular classes with our own young men and women; because we do not now just how to grade you nor where to place you. Your knowledge of our language is inadequate, and it would be unfair to you. We have decided to give you private instruction until you are qualified to take your places in society as useful and honored citizens; provided of course that your mentality is capable of absorbing our instructions. You will presently be introduced to your instructors, in whose charge you will remain until your education is complete, or until your maximum capacity for learning has been reached, as the case may be. This will undoubtedly cover a period of thirty-five years, or even longer."

"Wouldn't that arouse your indignation?" Lacey whispered to me.

"I have another painful duty to perform at this time," the Zerko continued. "I have a message for Dorothy Brewster. My son has asked for permission to make her his lawful wife. His request has been denied by the Supreme Council. If he were destined to be a private citizen, the decision might have been different; but the time is almost at hand when, according to our ancient law, my crown shall be placed on his head. He shall then belong to the citizens of Dunel and shall rule this world for a period of five hundred years, if he lives so long, after which the throne shall pass to his son. The Supreme Council thinks it unwise to mix foreign blood of an inferior race with that of the reigning family. In spite of the debt we owe to Dorothy Brewster, the marriage must never take place. Baklo will have no time in the future to spend with you. He must remain with me, and continue his preparation for the high honor and great duty that shall be his within a few years."

"Yes, Lacey, my indignation is indeed aroused!" I whispered to Lacey, in reply to the question he had previously whispered to me.

The Castaways Are Determined

"YOUR instructors are here," continued the Zerko, "two men, Musgal and Sodop, and one woman, Tirzol. Tirzol shall supervise the instruction of Dorothy Brewster, while you men will be in charge of Musgal and Sodop. We hope you will find both pleasure and profit in their company. You have been under their observation during the period of your quarantine. Since they know something of your language and customs, we think they are best qualified to teach you. You will now leave the council chamber with them and remain in their company, doing as they tell you until your education has reached its maximum. But banish any thoughts you may have of ever returning to Barlenkoz.

"Before you go, Baklo has a few things he wishes to tell you in private; this will probably be the last opportunity you will ever have to talk with the future Zerko of Dunel."

Baklo had but little to say to us three men. He assured us that the decision was made against his own personal wishes; but to safeguard the interests of the citizens was the paramount duty of the Supreme Council. He expressed his regret that we must part, but this duty demanded it. He promised to do all in his power for us, provided it did not interfere with his duties to his people. He then took Dorothy aside and asked us to excuse them.

For two hours they were together. I do not know just what was said or promised. I am not writing a love story, and I would not tell, even if I did know. But when they parted, both were in tears which they made a vain effort to conceal. We had hoped that marriage was to be the reward of this splendid couple, but it now looked hopeless. Lacey and Winters expressed their sympathy; I don't know whether I wanted more to cry or to fight. I was so indignant at the Supreme Council for describing us as their inferiors, that it was the height of my ambition to tell them myself a few things about superior races and superior intellects. As George Davis would have said it, I felt like a bull-dog wearing a muzzle among a pack of wolves.

"Wasn't that a hot one about our intellects being capable of absorbing their instructions?" Lacey asked

when our party was alone: "I wonder what they are going to teach us. After wrestling with the professors of Belmont for two weeks at a time over the theories of Einstein, I am not afraid of anything these super-men can hand us."

"I never wanted to get into an argument so badly in all my life," I replied: "I can show that Supreme Council a few things about super-men that they do not suspect. I propose going back and asking for a show-down! Their decision regarding Dorothy and Baklo was just about the most unfair thing I ever hear of! I wonder if they think their own beauties are better material for the royal family than she. They'll have a hard time convincing Baklo that they are."

"Dr. Haverfield," Dorothy replied, "I appreciate your feelings, but discretion is our most powerful weapon at this time. I have crossed the greatest barrier ever erected by Nature. The 'Brewster grit' knows no barriers nor obstacles that can not be overcome. I intend to overcome the objections of this Supreme Council. I do not know how I will do it, but it shall be done. The battle is not over, as the Supreme Council thinks; I have not yet started to fight."

"When you do start," I replied, "we are all with you to the last breath."

"Thanks, Dr. Haverfield, I know that I can depend upon all of you in any emergency. I think the first thing and the best thing that we can do, is to master their instructions. We will no doubt learn something that will be useful when things finally do come to a showdown."

"I agree with you," I replied. "We will show them that our inferior intellects are capable of absorbing anything they have to offer. We must all do our level best."

"Atta boy!" Lacey cried: "The fighting spirit of Belmont. We'll show them that we can handle any thing they have when the honor of Belmont is at stake!"

"There is more at stake than the honor of Belmont," I replied: "They do not think of us as representatives of Belmont, nor of the United States; to them we are Barlenkozians, and they despise all Barlenkozians equally. The honor and reputation of the world is at stake. Our conduct and our achievements will determine the reputation of our entire world. Do not think that the eyes of all the Selenites will not be upon us. During our thirty-five years in school we will have the opportunity to show them that, given equal opportunities, we are not inferior to their own race."

CHAPTER III
Eight Years Pass

EIGHT and one-half years have passed since the second interview with Zerko Tarkomas and the Supreme Council. With the exception of the past two months, this entire time was spent in learning the subjects taught to the young men and women of Dunel. Before we left home, Winters thought himself a chemist; but he now admits he had not even made a beginning in that deep subject. Lacey says he is now prepared to give the American scientists a few lessons in elementary engineering. As for myself, when I was president of Belmont University I thought myself a very learned man. Today I feel ashamed of my former ignorance.

These years were not all spent in drudgery and hard study. We had a lot of fun during that time. With my youth restored, I was in a position to enjoy life; and the only thing that marred our pleasure was the knowledge, or belief, that we would never again revisit our native world. But now since we have returned, our greatest fear is that we might contract some fatal disease that will put an untimely end to our promising careers. When one looks forward from the age of sixty-six to a long life, the outlook is entirely changed.

In this manuscript I shall not detail the subjects of our studies during our years of education in Dunel; I shall leave those of chemistry and mechanics to Winters and Lacey. But I shall attempt at this time to give my readers a short lesson in history, as I have learned it on the moon. Only by a study of the past, can we hope to understand the present or to have a glimpse of the future. This brief lesson in interplanetary history is given without any apology; for it will enable the people of the Earth to understand conditions as they now exist on this so-called dead world. It will not only throw a new light on certain problems that have baffled our scientists for a long time, but it will enable everyone to understand the great work just ahead of us and the rewards that will soon be the common property of all terrestrials.

It was a great surprise to me to find *Homo Sapiens* on the moon. According to all accepted laws of science, evolution has less than one chance in a million to duplicate her work on different planets. When I first learned that humanity existed on the moon, I at once suspected that their ancestors and ours had a common origin. Since our scientists believe the moon was cast off from the earth, from that part now occupied by the Pacific Ocean, I attempted to build a theory that the ancestors of the Selenites became separated from our own at that time, and their development had been along the same lines as our own. A few sober thoughts convinced me of the absurdity of such a thing, because the separation of the two bodies was supposed to have occurred while both were in a molten condition, ages before any form of life ever appeared on either world. I decided to bide my time and see if the Selenites themselves could throw any light on the subject. They did, and what an amazing story it is!

Their knowledge of history covers a period equal to almost a *half a million of our years*. It begins on a planet, located about 260,000,000 miles from the sun, which in those days was somewhat larger than it is today, and gave off more light and heat. This planet, which they knew by the name of Tiverpo, was the oldest in the solar system, or rather it was the first to acquire conditions favorable to plant and animal life. Many forms of life had their genesis on Tiverpo, and a few of them still survive. Chief among these is the human race itself.

The records of the earliest human beings are clouded in obscurity. They were too unintelligent to record anything, even in the form of pictures on the rocks; but as time passed, the race developed an intelligence. I have neither the time nor space in this manuscript to describe the first early people. I shall pass over a period of several thousand of their years (each *four and one-half times* as long as our own year), and tell of the two outstanding races that eventually developed.*

* It is not established among the Selenite scientists, that the origin of the human race took place on Tiverpo. Many things indicate that humanity came from some planet outside the solar system, but, since all early records were destroyed, that will always remain an unsolved problem.—W. H. H.

In the torrid zone of Tiverpo, there lay a great continent called Vudu. The inhabitants of this country developed an intelligence thousands of years before the other branch of humanity; which occupied a more temperate continent, known as Kroy. The Vuduites, from constant exposure of their bodies to the rays of the sun, were dark-skinned, while the Krojans, who lived in caves and clothed themselves with the skins of animals, were of a fair complexion. The Vuduites, during an indefinite period of time, built up a civilization which eventually reached a high standard. Wars waged against the Krojans, who never organized against their enemies, were more of the nature of a hunt for wild beasts. The Krojans never fought until cornered, and the Vuduites found it easier to take them prisoners and offer them as sacrifices, to their black deities, than to draw them into battle. After a time it was learned that the Krojans could be taught to do menial tasks; which they preferred to do, rather than be sacrificed to a black god in a painful and cruel manner. It is doubtful if this profited the white race very much; they proved such valuable slaves that the Vuduites began a systematic search for more slaves.

Tiverpian History

AS a result, the entire race of Krojans were enslaved by their black neighbors. Their association with the superior race civilized them to some extent; at last, they learned to become dissatisfied with their condition and rebelled. The rebellion was soon ended by a victory for the blacks. For a period of over two thousand Tiverpian years, the history is nothing but a series of unsuccessful rebellions on the part of the slaves; and a series of the most frightful and cruel punishments administered by their black masters, who recognized the fact that their slaves were fast becoming their equals in intelligence.

During the same period, the blacks made a tremendous improvement in their sciences and manner of living. Their history, as we now read it, reminds one of the development of our own race during the past six hundred years. Their scientists made discoveries and inventions that finally reached a stage beyond that of present-day terrestrial civilization. Electricity was used for many purposes. They had fast trains and large ships, which handled the bulk of their commerce. Their conquest of the air was perfect; they had learned to control gravity and make astronautical voyages to other planets, which proved either unfit or unavailable for their own use. They knew much of the atom and the electron; they had learned to change the arrangement of the atom and transmute one element into another. They knew that the atom held unlimited power, but they never learned to harness it. But, in spite of all their scientific knowledge, they still clung to their primitive religion and continued their sacrifices to the black images of the sun god.

At last the sun god became angry or something else happened that has never been given a scientific explanation. A change came over the climate of Tiverpo. The sun did not give quite as much heat as formerly, or the condition may have been caused by the atmosphere of their planet; but, as a result, the part of Tiverpo on which they lived cooled and the regions which had been merely temperate became too cold for comfort. The blacks' scientists could not understand the cause, though they conducted all sorts of elaborate researches. But they did find the remedy. They made a change in the composition of the atmosphere of their planet, and relieved the situation.

Through their knowledge of the atomic structure of matter and their experience in transmutation of the elements, they had learned to change solids to liquids of an entirely different atomic structure and nature. A strange liquid, made from solid rock, was in turn transmuted into a gas, unlike any other known at that time. This gas was similar in some properties to our oxygen and was entirely invisible. It was impossible to make a great amount of hydrogen unite with it. In fact it repelled hydrogen. Water vapor could not endure in the new atmosphere for a very long time; consequently there was but little evaporation, few clouds and almost no rainfall. The waters of the sea remained without evaporation. The land became a desert and a system of canals for irrigation became necessary in order to support life. But the desired changes were brought about; the air became clear and almost invisible, permitting the rays of the sun to pass through much easier and warm the planet that was getting too cool for comfort.

The white race was now almost the equal of their black masters in intelligence. They knew how to operate and use all the machinery in their world, but they were not permitted to become educated beyond that point. Their masters were determined to keep them in ignorance and subjugation; and only by secret methods did the slaves learn the secrets that were denied them.

Centuries later, the planet became overcrowded. There was no longer room for the large, increasing population. The blacks would not consider limiting the numbers of their offspring; and the white race was too valuable as slaves to limit their numbers. Science was able to supply one solution: other worlds must be used for a dwelling place for their multitudes.

Scouting expeditions were sent out in gravity-control space-flyers. On Mars they found a strange but intelligent form of life which was able to thwart the plans of the invaders. Venus was inhabited by unintelligent forms of life; but it was not adapted to human habitation, because of its unusually large atmosphere and water. The larger planets, outside the orbit of Tiverpo, were too large (their force of gravity was so strong that it was impossible for a human being to rise to his feet) and cold. *The Earth was not then a member of the solar system.*

But Dunel, the smallest and most mountainous of all the planets, met their requirements. The most intelligent natives of this world were those creatures with the wide feet, "The Flat-Footed Selenites." Only a few of these, which have been described by Miss Brewster, are now in existence. Like the American bison, they are facing extinction.

The End of Tiverpo

THE Vuduite explorers found Dunel very mountainous, but there was an abundance of air and water. The massive foliage of the plant life made much work necessary before it could be made into a satisfactory home for the human race. A large colony of white slaves, with merely enough blacks to keep them in subjugation, was brought to the little world. In time, other colonies arrived and Dunel was soon populated. The new world was much smaller than the old; the settlers found themselves very light in comparison to their former weight. For a time, the sensa-

tion of lightness was very popular with the blacks; but they were a pleasure-loving people and preferred the luxuries and comforts of the old world to the labor and pioneering life of the new. Realizing that their slaves might now make a successful revolt, the masters fastened heavy irons around their ankles, wrists and waists to weight them down and make their movements difficult; while they themselves remained unencumbered and had but little difficulty in keeping their slaves in submission.

During a period of two hundred years, the civilization of the old world was brought to the new. Most of the inhabitants were now slaves, with only enough masters to supervise the work. The majority of the pleasure-loving and somewhat lazy blacks remained at home, where the comforts and pleasures of life were more abundant. Their scientists were still making progress in learning the secrets of nature and using her mighty forces. But the power within the atom continued to baffle them; many were inclined to consider it unavailable, but others continued to struggle with their apparatus in an effort to be the first to release and utilize this tremendous power.

While the effort to develop atomic power was at its height, a certain space-flyer left Tiverpo with a cargo of provisions and more white slaves, bound for Dunel. They were many million miles from the old planet when they witnessed the sudden destruction of Tiverpo. Motion pictures were common in those days and a camera was busy taking scenes of the planet at a distance, when the world seemed to fly to pieces. (Those pictures are still preserved, and our party had the opportunity to see the planet explode.) A flash of light and a cloud of smoke that rapidly spread throughout all space was all there was to it. Nothing remained but particles of atomic dust, cloudlike in appearance, which rapidly scattered throughout millions of miles of space in all directions. A last cloud which had continued to follow the orbit of the lost planet around the sun, began to disperse as the particles of atomic dust began to collect into small miniature worlds known to terrestrial scientists as asteroids. Thousands of these still exist to this day, while another part thrown off at a tangent was captured millions of miles away by other planets.

Jupiter was near conjunction at the time of the destruction. His enormous gravity drew toward him many of the fragments, some of which fell to his surface, but *two of the largest* began revolving around him as satellites. Many fragments fell sunward; *one became the lesser moon* of Mars, revolving around that planet in one-third of the time Mars turns on his axis. One fragment almost struck the space-flyer itself, as it tried to place more distance between itself and the scene of the disaster.

It is believed that a scientist of Tiverpo had succeeded in liberating the power of the atom, and found it uncontrollable. The atom whose power had been liberated released the power of the atom nearest it; which in turn released the power of others in the vicinity. Each atom exploded the atom nearest to it and like a spark in a keg of powder, the entire planet exploded. Of course no one lived to tell the story, but the accepted theory, and probably the true one, is that given above.

The only remnant of humanity was now on the smallest planet in the entire solar system which, from its small size, could not support very many inhabitants. The Krojans now realized that they outnumbered their cruel masters more than ten to one. They made a desperate effort to regain their freedom; but the Vuduites had taken such precautions that what promised to be a great insurrection ended only in a massacre of many of the slaves. Realizing that their ancient supremacy was now in danger, the blacks did all in their power to curb the growing power and numbers of their slaves. They attempted to destroy white children as fast as they were born, and perform on the adults surgical operations making them permanently sterile. But the whites, in order to escape these outrages, adopted new tactics. As individuals they succeeded in doing that which they had failed to do working together. Acting as a whole, they had never had an organization nor a leader capable of uniting them successfully. Acting separately, it was a case of each man for himself; thousands perished, but enough escaped, one at a time, to defeat the plans of the blacks. The slaves continued to watch their opportunity to escape and hide in the mountains. When the heavy iron shackles had been removed from their bodies, they were more than the equals of their former masters. In a short time communities were formed in the mountains, composed entirely of escaped slaves and their children.

CHAPTER IV

At Home on Dunal

WE have now reached a point, in this brief lesson in interplanetary history, where a few dates are necessary. On Tiverpo, the years were numbered from the birth of a great, and probably mythical, religious leader named Vudu, who gave his name to their race, their continent and to the revolting practices which he taught, of human sacrifices and hideous ceremonies in reverence to the black images of the sun-god. It appeared as strange to me as it probably will to my readers that, in spite of the scientific knowledge of the ancient black race, they still held to the abominable practices of Vuduism. But all the records of the Selenites confirm the fact that they were always superstitious, even at the height of their greatest civilization, and were ever ready to believe anything their priests told them, in spite of its own contradictions, if it savored of the supernatural. Since forms of Vuduism still exist among the black descendants of this race, it is not at all strange that the color of their skins is more easy to change than this superstitious racial characteristic.

Before Vudu, their records go back for a period of over 7,500 of their years, but evidence found at a later date confirm the stories of prehistoric culture existing ages earlier. (It must be remembered that their year was four and one-half times as long as the present terrestrial year.) The continent of Kroy was discovered by the blacks in the year 2718 A. V. (my own abbreviation for After Vudu). The Krojans were entirely enslaved before the year 3500, but their change of atmosphere did not occur until about 16,750 A. V. The first settlement was made on Dunel in the year 37,792; and the destruction of Tiverpo took place two hundred and twelve years later, in 38,004 A. V., after a recorded history of 45,500 of Tiverpo's years (or almost 200,000 of our own).

After the destruction of Tiverpo, the black race attempted to continue their old methods of measuring time; but those whites, who had escaped and founded communities of their own, adopted another method,

basing the year on Dunel's motion around the sun, making it slightly more than fifteen terrestrial months. Little is known of the activities of the Vuduites during their next two thousand years. The white tribes soon became nations, of which there were no less than fifty. They still continued to speak a form of the ancient Vudu language; but had no dealings with their former masters and no news from them other than the stories of escaped slaves, who continued to arrive and make their homes with the whites.

Amazing progress was made by the whites after their escape from slavery. With but few exceptions, every nation abandoned all the old forms of Vudu worship and adopted a religion of their own, the origin of which was the evolution taking place in their own minds. The new deity was a personification of the laws of nature and science, who had created these laws and never permitted the slightest deviation from them. Conscious human conduct was not considered an affair of the deity; since there were no infallible natural laws by which human behavior was governed. Natural impulses and instincts were considered the only laws by which mankind was governed. Their priests worked in laboratories, trying to learn more of the laws and secrets of their deity, after which they taught them to the people.

All their priests were scientists and their deity was very kind to them in revealing scientific knowledge. The valleys and plains of the new world proved to be very fertile while the mountains were rich in minerals and natural resources. Their progress and prosperity continued unchecked for a period of two thousand years. Their cities and villages were scattered over every available and inhabitable part of their world; in certain mining regions, underground cities were not uncommon. Telephones, radio, television, and motion pictures, which had already reached a high state of perfection, were very commonplace. Their commerce and means of travel on the land, sea and through the air had been perfected to a point where there was but little to be desired short of the control of gravity, which was known only to the blacks. Transmutation of the elements was known to them, but it was far from being of common knowledge. The cost of transmutation had not at that time been made low enough to be practical, except in the case of the more rare and costly substances.

Wars were common among the many nations, as they found their numbers increasing and their territory becoming over-crowded. Many wars were waged against the Vuduites; but that race had long ago located their cities and strongholds in strategic places—the wide craters of extinct volcanoes, the high rims of which were fortified to such an extent that they easily repulsed the attacks of the white invaders. Several of these strongholds fell under the continued attacks of the whites, who were aided on the inside by their friends still in bondage. But they never succeeded in their two greatest ambitions: to wipe the Vuduites out of existence and to obtain the secret of the control of gravity.

During the two thousand years on the new world, the human race had perfectly adjusted itself to the new conditions. On Tiverpo, the force of gravity was about four-fifths of that of the earth, as near as I could make an estimate. On Dunel it is only one-sixth. Coming from Tiverpo to Dunel, they found their unusual lightness very annoying as they attempted to duplicate the activities of the old world. But their lightness called for less physical exertion. Among the blacks, who had slaves to do all their menial tasks, laziness and obesity became a racial trait. The whites, who were encouraged by the amount of work that could be done with a minimum of exertion, continued with renewed efforts. They soon learned to look upon their lightness as a very natural and commonplace condition. After seventy generations an unnoticed physical weakness, which eventually offset their lightness, was the natural result.

A Menace From Space

FOR several decades, astronomers had been viewing with alarm a new menace in the northern skies, which caused both races to forget their wars and worries over too large a population. A new star had appeared, which was first thought to be a comet; but as its brightness increased, it was discovered to be neither comet nor nova, but a huge sun almost as large as their own, approaching the solar system at an appalling rate of speed! Terror seized the population of both races when it was announced that the stranger from outer space would pass through the solar system and probably collide with their sun or some of his planets. It was calculated that the two suns would draw each other out of their respective paths and collide with each other. Speculation was rife as to the outcome of the collision; it was feared that the two suns would unite and from the explosion of this great combined mass all the planets would be extinguished.

Years of terror and suspense followed, as the alien sun continued his terrifying journey toward Dunel and her sister worlds. Fear of annihilation caused the people to forget their culture and an unprecedented crime wave followed. Some of the white nations again adopted the Vudu religion, in an attempt to persuade the black sun-god to come to their aid and save them from destruction. Vudu rites among the blacks became an outrage to anything that could be called a religion. Over half of the slaves and many of their own women and children were sacrificed to the cruel deity; but the menace in the skies continued to increase in size as the two suns and their families of planets grew nearer to each other.

At this crisis, there rose one of the greatest characters in human history; a man who is now regarded on Dunel as the savior of their race. His pictures and statues, which remind one of Zeus, the king of the Olympian gods, still adorn every public place in that little world. For a long time he was worshiped as a demigod, and his name is still revered above all others. In time his name has become a synonym for authority, wisdom and royalty—it is Zerko.

Zerko had been educated for the priestcraft of the nature-worshiping white nations. He had just started his career when the menace in the skies terrorized the world. From the start he showed his supremacy by maintaining his equanimity and never becoming excited nor terrified as he calmly made an exhaustive study of the alien sun and his family of planets. He was the first to discover that the two suns would not collide. He learned that the alien sun would cross the solar system at a point outside the orbit of Jupiter, who would at that time be on the opposite side of the sun.

When he announced his discovery, other astronomers checked up on his findings and confirmed them, after which the people breathed easier and conditions were almost restored to normal. But Zerko soon saw that

he had overlooked dangers. Now that the suns were out of danger, what about their families of planets?

He found that Dunel and Venus would be between the two suns. Uranus and Neptune would be nearer the alien sun than their own, but probably still far enough away to be out of danger. Mars and Jupiter would be on the opposite side of their own sun in a zone of safety. A solar being would have seen Saturn at right angles to the invader, over a billion miles from it.

The size and position of the alien family of planets was harder to determine. He found that two of them must pass dangerously close to our sun; another would come within a million miles of Jupiter; while the orbit of another planet would cross the orbit of Dunel. This alien planet was about fifty times the size of Dunel and would be much nearer our sun than her own mother sun. But the most terrifying thing of all was the fact that the menacing planet and Dunel would both want to occupy the same position at the same time! A head-on collision was inevitable!

CHAPTER V

The Coming of Destruction

ZERKO was not the man to sit idly by; yet he realized his inability to avert the calamity that threatened the destruction of his world and the annihilation of his race. Like all men in trouble, he wanted someone with whom he could discuss the matter, so he called a conference of the ablest scientific men available. As he showed them his charts and calculations and explained everything to them, they agreed with him that a collision of the two planets was inevitable, and less than a year remained in which to prepare for the end of the little world.

Zerko had seen a terror-stricken population only a few weeks earlier and knew that men, bereft of reason, constituted a greater and more cruel menace than the stranger from outer space. He advised against informing the masses until some hope was found for saving his race, or until all hope was abandoned. After a lengthy conference, it was decided that the safest place at the time of the collision would be on the larger planet or on some planet entirely out of the danger zone. But to move the entire race in so short a time was out of the question, and to move a few of them was equally impossible; since the whites had no space-flyers and did not know the secret of the control of gravity. To ask the Vuduites for help was even more absurd.

But volunteers were found who were willing to enter Vudu cities in disguise and attempt to steal either some space-flyers or the desired secrets. Their heroism ended in disaster. The spies were discovered and under torture were compelled to reveal their plans. The blacks at once placed a stricter guard over their secrets; while their astronomers turned their attention to the menace in the skies, verifying Zerko's prophecy and giving the news to the people.

Zerko was baffled. Under the strain that followed, his assistants deserted him and the reign of terror began anew. Under the circumstances, most men would have given up in despair; but Zerko proved that he was no ordinary man. He never lost hope, even during the most trying times, and never abandoned his untiring efforts to find a means of saving his race from extinction.

The next few months were the darkest period in human history. They were full of unbelievable acts of wholesale cruelties and insanities. Religious meetings reached fanatical heights and many followed the conflicting rites of both Vudu and the Nature God. Lawlessness reached unheard-of limits; the penalty of death no longer held any terrors for men who knew that their days were numbered. Those whose duty it was to control lawlessness were the worst offenders. Another class of people devoted their last few months to pleasure and indulged in the wildest orgies, maddest revelries and debaucheries of all time. When it was learned that the blacks were planning to seek safety in their space-flyers, the whites started a war against their strongholds, in which countless millions of both races lost their lives. White men actually begged the blacks for the privilege of betraying their countrymen and being taken away from the doomed world as slaves.

But Zerko remained faithful to his task, trying to pierce the depths of the secrets of nature, grasping every straw of hope for a doomed race. The course of the two planets through space was mapped again and again; the gravitational influence of nearby planets was carefully calculated and checked, but the result was always the same. The crash was certain; enough heat would be generated to annihilate his little world and his people could not escape it.

He began to speculate as to what would happen when the crash came. He saw that both solar systems would be in a state of chaos, every planet would be influenced by the gravity of all the others; and no man could foresee just what would happen. Perhaps the motions of the planets in their orbits, as they followed their respective suns, and unexpected gravitational influences, would cause either Dunel or the Menace ("Barlenkoz") to be thrown out of its course to such an extent that a collision would be avoided and his race would be saved. He never abandoned this idea; if his reasoning were correct, the safest place available would be the interior of his own little world, where he knew that large caverns already existed. To these places, he determined to take his people, believing there was some hope of saving his race.

Our own terrestrial scientists have long noted that the specific gravity of the moon is much less than that of the earth, causing them to think the two bodies are composed of different materials, or else the moon is full of holes and air-pockets like a sponge. Zerko knew that the latter is true; but it is doubtful if he ever gave the former much consideration. Underground cities in the mining regions were not uncommon and other underground cities could soon be built in the large caves. He issued bulletins to the people, advising them to move as much of their belongings to these places as quickly as possible, and to provide food supplies enough to last for a long time.

He also advised them of another danger, the scarcity of pure air. He instructed them to provide as many of the atmosphere machines of old Tiverpo, by which artificial air could be made by transmutation of the elements, as time and machinery would

permit. It is well to note in this connection that lighter matter is obtained from heavier, much more easily than heavy matter such as gold or lead can be made from lighter. For this reason, air is the easiest and cheapest compound to be produced synthetically. One ton of rock could be transmuted into one ton of liquid, which would take up much more space than rock. This liquid could be transmuted into artificial atmosphere, such as the blacks had used on Tiverpo, taking up much more space than the liquid. The pressure of the surrounding atmosphere would determine the space it would occupy; for the artificial air, like the natural, is perfectly elastic.

Precautions

TIDES produced by the sun were not uncommon on Dunel at this time; and Zerko knew that, as the menace came closer to his little world, tides of unusual height would be formed. He figured that they would rise high enough to cause the waters of the sea to pour into the caves and, unless precautions were taken, his refugees would be drowned like rats. He therefore ordered them to build at the entrance of the caves airtight and waterproof doors which could be opened and closed at will. He told his people that this was their only hope of safety when the collision occurred. But he could not guarantee that they would be safe even then; for all figures indicated that his world would be completely destroyed and their only hope was that some unknown force that he could not detect would cause the two planets to swing out of their path and avert the catastrophe.

Zerko's bulletins of advice saved a part of his race. In the centuries that followed, a certain religious sect tried to prove that his vision of the destruction was inspired. They tried to have him recognized as a deity; but the Dunellians of the present day refuse to believe that he was anything but a mere mortal, with a more level head than others of that age, a capable man and a great leader to whom they owe their existence. They cite the argument that, if there had been anything divine about him, he would have foreseen just what was to occur, and more of his people could have been saved. But, in any chaotic state of confusion, no human being can foretell any future event and, even in normal times, a glimpse of the future can be obtained only by a study of the past.

The greater part of the people ignored Zerko's advice. But over a million heeded them and carried out his instructions to the letter. Every available cave on the little planet was utilized and many of the doors erected at this time still remain. George Davis, in his manuscript, has described one of them, which we saw at the cave in Mount Despair. The centuries have made them no longer airtight, but they are still in usable condition. It must be remembered that there are no winds, no rain, no storms and no moisture in the air to cause corrosion on the moon; making it possible to keep things in a natural state of preservation for thousands of years longer than could be hoped for on the earth.

Hundreds of thousands of atmosphere machines were prepared during the last few months, and as will soon be seen, they did not come amiss. And as the body drew nearer there was now no difference between day and night, for a blazing sun was shining on both sides of the little world at the same time. Barlenkox, the big Menace, was now almost half as large as the sun as seen from the earth or the moon. Every time she rose above the horizon, her size was increasing. Long before anyone expected it, tides were formed which soon reached enormous heights. Many caves that could have been used by the refugees were filled with water. Work was hastened to make the doors watertight before it was too late.

Many strange things were now happening to add to the consternation of the people. The heat of the two suns and the absence of cool refreshing nights made life intolerable. But, to use one of Zerko's maxims: Nature does nothing detrimental without doing something beneficial at the same time. This condition remedied itself; the waters of the sea evaporated more rapidly and the resulting clouds and cooling rains hid the fury of the two suns and made conditions more tolerable. But the clouds also hid the big menace and it is doubtful whether this increased or lessened the terror of the people, who could not longer see the menace that threatened them, except from the tops of the mountains, high above the clouds.

Higher tides told them of the approach of the menacing planet they could no longer see. From all the seas of the little world, reports were coming in of ships washed ashore by the tides that were now over one hundred feet high. To get a correct idea of these tides, one must consider the daily tides that travel around the earth and try to imagine the result if the force producing these tides were six times as great, while the force trying to hold the waters to their beds were divided by six. Now consider the result if the two planets were approaching each other and the force producing the tides were increased each day; due to the fact that the force of gravity is influenced in inverse proportion to the square of the distance between the two bodies. Cities and towns along the sea coast were flooded one day, submerged the next and wiped out of existence the third.

The seas soon left their beds and combined into one huge tidal wave that swept around the little world as it turned on its axis once in eighteen and one-quarter hours. Storms increased in frequency and in intensity. Lightning flashed and the thunders rolled continually as the waters of the sea battered against the highest mountain tops. Those old craters were filled with water, destroying the Vudu cities and drowning the blacks like rats in a well. From many of the caves occupied by the whites, steam and hot water poured out, only to be followed by a terrible flow of smoke and lava. The survivors of humanity, who had never seen a volcano on their little planet, were too terror-stricken to know what they were doing. The titanic forces of nature were at work and the destruction of a world was at hand.

By this time Zerko's followers, over a million men, women and children, had entered their caves and closed the outer doors; but they did not escape the terrors of the destruction. Every device known to their scientists was in use; radios provided for their communication, television broadcasters located in thousands of places on the surface, enabled

them to see what was going on outside. Food supplies were provided for a long siege; while animals and birds of every desirable species were taken along for companions.

The rotation of the smaller planet on her axis had been slowed up as the menace came nearer and the tides became higher. But at every rotation, hot water and steam from the interior came up and threatened to destroy the remnant of humanity. At each rotation the outside gravitational forces acting on Dunel became more severe. All loose objects were thrown violently about the caves into which had leaked an appreciable amount of water. If Zerko had not foreseen this and taken the necessary precautions, it is doubtful if there would have been any survivors at all.

The End of the Danger

THE tidal waves, which had now reached unbelieveable heights, were no longer composed only of the waters of the sea. Sand, mud, stones, ships, buildings, plants and seeds of all kinds, as well as bodies of animals and human beings, every loose object on the surface of Dunel had mingled with the water and atmosphere, forming a tidal wave that soon passed high above the loftiest mountain tops, traveling around the little world as she struggled to keep up a feeble rotation on her axis.

Suddenly the skies cleared. The tidal wave had left the smaller planet and was now to be seen like a huge cloud, moving toward the Menace, which now filled nearly half of the sky, turning over and over on her axis like a titanic, spherical millstone, threatening to grind everything to pieces beneath it. The time scheduled for the crash was now at hand.

Two blazing suns beat down upon the helpless little world, robbed of all her atmosphere, water and plant life. The handful of survivors in the caves were waiting with terror for the approaching menace. From moment to moment, they expected the crash that would shatter their little world into pieces and destroy it in one titanic vortex of incandescence. But the time for the crash had arrived and the end did not come.

Roofs of the caves fell, as a terrible earthquake shook the little world to its core, opening the cracks in her surface, known today to terrestrial astronomers as lunar rills. Barlenkoz, which had been apparently moving from east to west across the sky, now remained stationary. Slowly the Menace, the two suns and all the stars began to move from west to east; Dunel had ceased to rotate on her axis and was now rotating in the opposite direction! A new terror gripped the hearts of the survivors as they witnessed this change in their television screens. "What had caused it?" they all asked in one breath, but no one could answer.

A ray of hope came to them when they noticed that the menacing planet was no longer approaching. The distance remained the same as the terrible sphere continued to roll over and over. Zerko now saw that the two planets were revolving around each other on a common center of gravity. Dunel had entered the gravitational field of the larger body; but her own motion in her orbit around the sun not only prevented her from falling to the surface of her enemy, but caused her to move farther away. This was due to the fact that the centrifugal force produced by her motion around Barlenkoz was greater than the gravitational attraction between the two bodies. Zerko knew that the two bodies would continue to move farther apart until a position was reached where the centrifugal force was exactly equal to the gravitational attraction; and this delicate balance would be maintained until some age in the far distant future, when the equilibrium would be disturbed.

Then came another earthquake! The suns and the stars again changed the direction of their motion across the sky. Humanity was bewildered; no one had an explanation. The Menace had ceased to move across the sky, but still continued to wobble, maintaining approximately the same position above the horizon. Quakes (I should say moonquakes) now occurred at regular intervals, which were getting shorter and the quakes were becoming less severe. With each succeeding quake, the motion of the stars was reversed and it dawned upon the survivors that Dunel no longer turned on her axis, but remained suspended in space with her heavier side turned toward the larger planet. The severity of the quakes soon became lessened, but the rocking motion of the stars continued for many years, until Dunel became adjusted to her new condition of being a satellite with her heavier side turned toward her adopted mother planet.

Before the Destruction, the other side of the moon was one vast sea, about 2,000 miles across, with a depth that had never been fathomed. When it was filled with water, the surface was even more and the little planet was almost a perfect sphere. But when the water had been removed, a vast hole remained, which was in some places over one hundred miles deep. This caused the side toward Barlenkoz to be the heavier; Dunel was no longer a perfect sphere, but somewhat lopsided. This prevented her turning on her axis while so close to a body with a superior force of gravity. The heavier side turned toward the larger planet very easily; but when it attempted to turn away, the heavier side was moving up-hill, with reference to the earth. The momentum caused by the motion of the moon on her axis was not enough to carry the heavier side past center, so it stopped and came to rest for a brief instant before turning in the opposite direction. The change of direction did not cause the earthquakes, although this was the indirect cause. A reversal of rotation caused disturbances in the molten interior, breaking down internal walls, permitting water to come in contact with lava and producing steam with such a force that the moon was shaken to its core.

A New Solar System

ALL danger of a collision had now passed, but the work of the Destruction was not yet complete. The alien sun and his family of planets had approached the solar system from the northern skies, crossed the plane of the orbits of the planets at an angle of about seventy degrees, passing again into the outer space of the southern skies. When Barlenkoz and Dunel almost crashed, Dunel had entered the gravitational field of the larger planet and, according to Dunellian theory, they began rotating about a common center of gravity. But

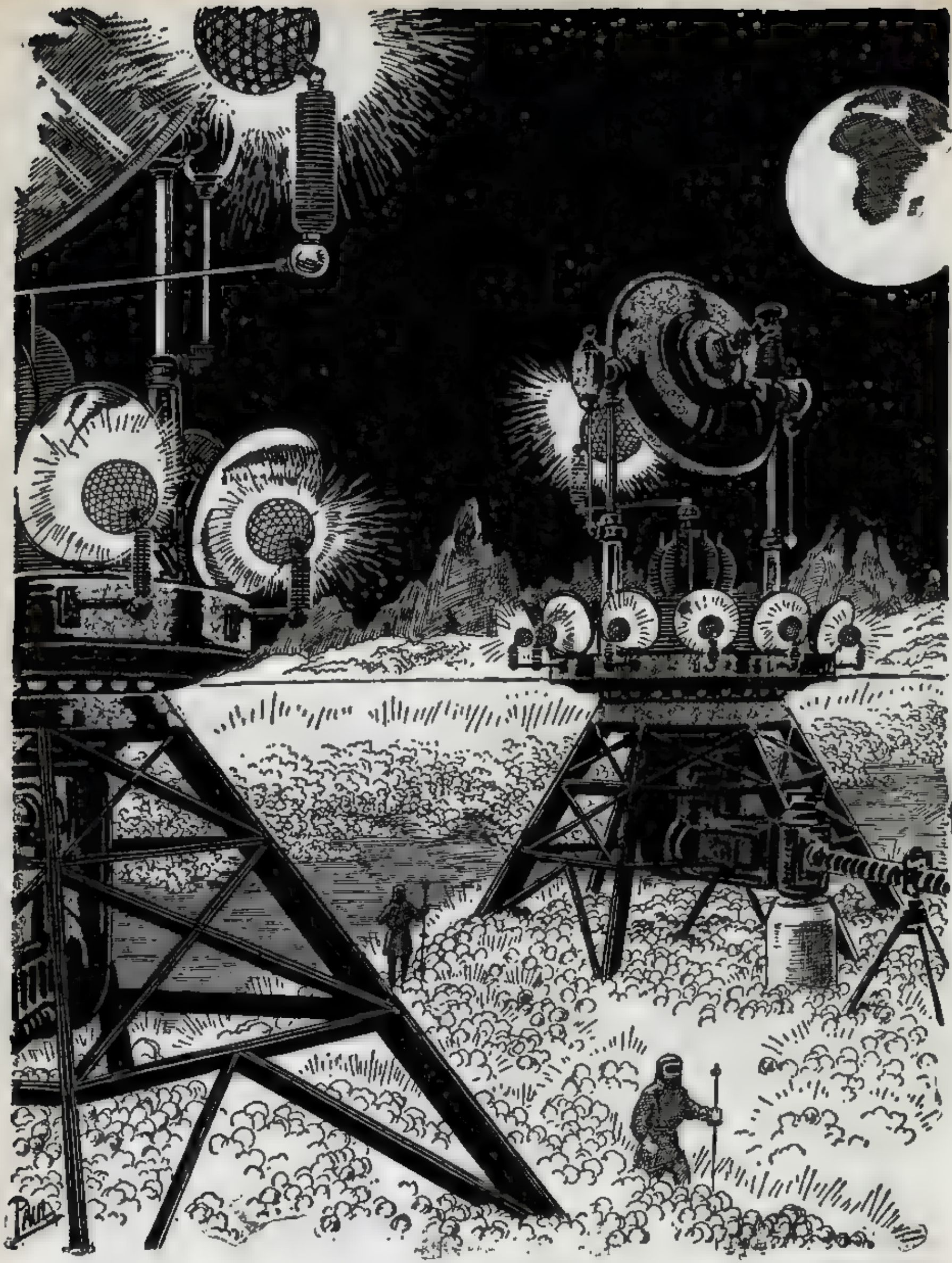


Illustration by Paul

The largest of these solar power plants was located at Tycho. The rays of the sun were captured, transformed into energy and transmitted to the caves where they were again transformed into light rays.

the motion of Barlenkoz toward the southern skies, as she followed her parent sun, carried her and her captive far to the south. For some time it was problematical which sun she would follow. She was nearer the sun that humanity had always known; but her motion toward the south was to be considered, as she was now far south of the plane of the orbits of the planets. The laws of gravity and motion compelled her to leave her old orbit, desert her mother sun and become a captive of the sun with the superior force of gravity. Her new orbit around her adopted mother sun was at an angle of about sixty-six degrees to the plane of the orbits of the other planets.

This eccentric orbit of Barlenkoz around her new sun caused her to turn her north pole toward the sun for a period of six months, while the southern hemisphere was turned toward outer space, perpetual darkness and absolute zero. During the next six months, the northern pole was in darkness, while the southern hemisphere was bathed in perpetual sunlight, without any periods of day or night. Once each year, each polar ice-cap melted; while the opposite frigid zone extended as far south as the Tropic of Cancer or as far north as the Tropic of Capricorn. In the torrid zone, the sun was overhead twice during the same year and never dropped entirely below the northern or southern horizon, even when the poles were receiving their maximum of light and heat.

It is doubtful whether this annual freezing and thawing of the polar regions at this period was identical with the glacial periods of which present-day geologists tell us. There are times when it appears to me in contradiction to their doctrines; but at other times I am inclined to believe that this was the exact time when polar ice-caps moved down across the North American continent, scooping up huge loads of sand and gravel in certain places and depositing their loads farther south, forming sandbanks and hills. This ice in melting was powerful enough to cut deep valleys in the hills of that region and deposit the sand and debris in what is now the Mississippi Valley. This may have been the exact time when the geological features of these regions were made over, but I shall only submit the facts and leave it to others to determine. The date of the Destruction corresponds to the estimated date of the last glacial age; but the records of the Selenites, including photographs of our earth, both before and after the destruction, will throw a new light on an old problem.

These extremes of temperature were even more severe on Dunel. Robbed of her atmosphere, there was nothing to protect her from either extreme. As she now kept one face toward her captor, her days and nights had reached their present length, making life impossible at any point on her surface. Only within the caves, where the remnant of humanity had taken refuge, together with certain selected species of birds and animals, were there any conditions favorable to life. But even in the caves, it was very unpleasant and Zerko soon found that his followers were becoming restless and rebellious.

But even the mighty Barlenkoz could not always continue to disobey the laws of nature, which compelled all planets to revolve around the sun in approximately the same plane. The gravitational pull of all the other planets exerted a constant influence, although comparatively slight, toward their erring adopted sister planet. In attempting to draw Barlenkoz toward them, they pulled her out of her erratic orbit and the polar regions no longer received the light and heat of the tropics. But hundreds of centuries passed before Barlenkoz became stabilized in an orbit of her own, a few million miles farther away from the sun than the old orbit of Dunel.

When the alien sun passed into outer space in the southern skies, her planetary system was badly crippled. She had gained one planet, which had previously occupied an orbit outside that of Neptune. Our sun did not really miss this planet, since she had gained four bodies. Jupiter had acquired a new moon, one planet had fallen into the sun, another (Mercury) had taken up an orbit near the sun itself, and little Dunel had gained a satellite (according to the present Selenite way of looking at things. We prefer to think that Dunel became a satellite of Barlenkoz of the sun, just as Barlenkoz is the sun's satellite. They hate to think of their world as revolving around ours and always insist that the two bodies revolve around their common center of gravity.)

No story of the Destruction is complete without an answer to the question of "What became of the black race?" It will be remembered that, owing to the intense hatred between them, the two races had no communication with each other; other than the stories of escaped slaves as they continued to join the many small nations of whites. At times radio and television messages were intercepted; but as a source of news, this was trifling. It was not until three centuries after the destruction that a group of white explorers entered a former Vudu stronghold, known to Terrestrial astronomers as Copernicus. In a cave-like building that had survived the destruction they found among other Vudu records a manuscript that told of their exodus from Dunel at the time of the destruction.

The Vudu Manuscript

AFTER the destruction of Tiverpo and the threatened overthrow of their supremacy, they adopted every plan imaginable to preserve their racial superiority. The attempt to make the whites sterile had brought about the rebellion that resulted in the escape of thousands of slaves and the establishment of the white nations. For a time the population of the slaves was regulated; but the rate of increase among the blacks was not fast enough to please them. On Tiverpo it had been illegal to mix the races. All children born of such illegal unions, as well as the white parent, were promptly sacrificed to the sun-god, in order to purify the soul of the erring black parent. But in this emergency, the debasement of Vudu blood promised the maintenance of Vudu supremacy. White women were forced to give birth to children of black fathers. The experiment proved successful, as the children were more black than white.

At the time of the destruction, the Vudu nations were on the downward trend. They had developed into scattered nations of three races: The dominant blacks, overfed, obese and lazy; the white

slaves, overworked and underfed, and a brown half-breed race, denied the privileges of citizenship and exempt from the degradation of slavery. When the Destruction was foreseen, it was decided to seek refuge in their space-flyers until the danger had passed; after which they expected to make their homes on the larger planet, provided it were found suitable. The white and brown races were put to work conditioning their thousands of gravity-controlled spheres, which were already in use to provide a means of commerce and travel between their strongholds, and could be easily changed into space-flyers. The black scientists made a study of the menacing planet and made plans for the transmigration. They believed not only that the new planet would be a better home for their race, but they would have an excellent opportunity to re-establish the ancient glories of Tiverpo.

From the high circular rim of mountains surrounding their strongholds, they were able to see the big Menace and make charts of its physical characteristics. Copies of these old maps and photographs are still available. To one acquainted only with the modern world, it is hard to identify the old earth with the modern. For instance, all continents appear larger and the seas smaller. This would indicate that the effects of the addition of the lunar seas to the terrestrial did make a noticeable change. But mathematical calculations show that but a small percent of our sea water could have come from the moon. The sinking of the continents is a more scientific explanation. But at any rate, the continent of Atlantis appears on all early photographs of our world. The West Indies is a continent, extending almost from Florida to Atlantis. The Bering Sea is a part of both the American and Asiatic continents. The Gulf of Mexico extends as far north as the present site of St. Louis; while the Great Lakes and Hudson Bay do not exist. The British Isles are not only connected to the European continent, but that continent extends almost to Greenland. The Sahara is a vast sea, and two small lakes, below the level of the sea, occupy the site now occupied by the Mediterranean. Asia and Australia are connected by land, and the Pacific is full of countless prehistoric islands.

After a study of the new world, the blacks decided to make their homes in the torrid zone. Probably they could foresee the extremes of temperature to which all land outside those regions would be subjected. But the result remains that Africa was selected as their future home and the most promising place of all was just south of the sea now occupied by the Sahara Desert, near the equator.

After the first tidal wave, their cities were deluged. Their leaders became alarmed as they knew the tidal wave would be higher each day. Without giving any warning to the masses, they decided to start. They knew the impossibility of taking their entire race; but word had been given out that every black and brown person would be taken care of and the slave race would be left behind to face the terrors of the Destruction in company with the nations of escaped slaves. But their leaders had no intentions of keeping their promises; they could not endure the thought of doing their own menial tasks—slaves were a necessity. White slaves and brown workers were smuggled aboard the space-flyers. As many blacks as could be accommodated made up the remainder of the passenger list. The blacks on the outside were led to believe they would be saved; so no resentment was shown when their betrayers entered the space-flyers on what they claimed was a tour of inspection.

The war between the two races had now reached a climax. Millions of the black race had fallen, and millions were now engaged in keeping the whites from pouring over the high fortifications and storming the city. When it was least expected, the space-flyers rose from the city. Suspecting treachery, the black warriors fired upon their escaping countrymen and succeeded in bringing several of thm to the ground. But the majority of the vast fleet continued to rise into the skies, leaving the doomed world behind them. An hour later the tidal wave arrived with increased fury, filling the crater of Copernicus with water.

The Vudu manuscript found a long time after in some excavations ends at this point. After the Destruction, no record is found of a black individual on Dunel. But the great race was not forgotten and it will be heard of at a later period in this brief lesson in interplanetary history.

CHAPTER VI

The Emerging from the Caves

OVER a million white men, women and children had sought safety in the caves at the advice of Zerko. This number was reduced to a mere handful; only thirty thousand survived the terrors of the caves when the two worlds avoided a collision by the narrowest margin, and these few survivors were scattered in hundreds of caves all over the surface of the now dead world. The survivors proved to be as ungrateful as any other group of people on record. The history of the first few years following the destruction is a parallel of the story of the Israelites turning against Moses in the winderness and of the Spaniards turning against Columbus. It was here that Zerko proved his mettle and made a name for himself that will be revered as long as any of his race lives to remember it.

He knew that the air on the surface of his world had vanished with the water; so he issued orders to all the caves with which he could communicate by means of radio and television, to keep the airtight doors closed and to put the artificial atmosphere machines to work at capacity. Small valves were made in the doors to permit the surplus air to escape when a certain pressure inside the caves had been reached. He already knew how to produce a synthetic food by transmutation of the elements; this process was taught to all his people, who could now see that their original supply of provisions could not last indefinitely. But this new food was not very palatable and the people complained.

None of the old kings or rulers had survived the destruction. The survivors, representative of all the white nations, resented the assumed authority of Zerko. In one cave, the people stubbornly refused to obey anything he said. They informed him that they did not intend to stay underground and starve themselves on his artificial food. They were going outside to live a natural life on the surface, as all human beings should live. But when they

opened the doors the air escaped and the rebels met an instant death. This incident taught the other refugees a lesson and Zerko had less trouble in maintaining discipline.

Everyone protested against the synthetic food, but Zerko was powerless to supply any other kind; he was forced to give them their choice between artificial food or starvation. No deaths are recorded from starvation; but Zerko found it almost impossible to prevent them from killing the animals and birds for food. These would be needed to multiply and replenish their world when enough synthetic atmosphere had been produced to permit their going outside. Many hunger-crazed people disobeyed him and incidents are recorded of murder and cannibalism. Without the capable leadership of Zerko, savagery would have resulted and continued until the race had perished. He saw the necessity of strict discipline; for he could not afford to lose any more of his people. He assumed the leadership of all the people and set himself up not as a king, but as Zerko, greater than a king; since he intended to force his dominion over all the people of his world. In each cave he appointed a Buzerk, who was responsible for the enforcement of rigid discipline in his own community. This was the genesis of the present Selenite system of government. Through sheer ability and power of leadership, he established the most autocratic form of government in the history of humanity. How he enforced his laws at all among distant caves entirely out of reach, will always remain a mystery to many. But if one were to see and hear him today through the medium of talking-motion pictures still in existence, they would know the force of his personality and feel the impulse to obey his ancient commands.

At last law and order was firmly established, and the entire population acted as one man. Atmosphere machines were made by the hundreds of thousands; thirty-five years after the Destruction, the atmospheric pressure on the surface was sufficient to support life. The doors of the caves were opened and an exploration of the barren surface of the dead world was begun. But Zerko had died before the doors were opened. After establishing a stable form of government and putting his people on the road to safety and progress, he died at the early age of seventy. His son succeeded him under the title of Zerko II, but his rule was short. He lacked the stern qualities of his father and after a council of the Buzerks, who saw the danger of the crumbling of the new empire, he was forced to abdicate the throne in favor of his son, Zerko III, who was quite capable but much more democratic than his grandfather.

Under Zerko III, a new system of time was established, which is still in existence today. He divided the day into decimal periods making eight units of time. The new chronometers looked more like our own electric meters than anything else terrestrial to which they can be compared. When the doors were opened, he brought all his people to as near a central position as possible, crowding them into fewer caves; for life on the surface was still unendurable. He then ordered a complete exploration of his world, which resulted in the discovery of a more favorable location for his people.

On the side of the moon which is never seen from the earth, the explorers found the region formerly occupied by the greatest and deepest of all the ancient seas. This depression is about two thousand miles across, extending almost from pole to pole. But the most amazing thing about it is the enormous depth of almost one hundred miles! In the bottom of this ancient sea there still lingered a remnant of the old sea water and atmosphere, together with several forms of animal life which had in some miraculous way survived the destruction, without human aid. Millions of new caves were found in the walls of the mountainous rim surrounding this vast depression. As soon as they could be made inhabitable, the entire population was moved to this new home.

Selenite Progress

THE story of the next thousand years is the story of a hardy race fighting against the cruel conditions of their world and making their homes under the surface more habitable. They succeeded in raising the atmospheric pressure to a higher point than before the destruction. The new atmosphere was the same as that produced at a much earlier age by the Vudu scientists of Tiverpo. It contained no nitrogen, but a satisfactory substitute, and as we have learned this atmosphere was invisible, there being no water vapor in it to reflect light.

Because of the low gravity of their world, this artificial air seemed very light, but in fact it is much heavier than our own. To maintain a high surface pressure, the atmosphere must exist to a height of several times that of our own. This is the reason we encountered an atmosphere before we expected it, when we arrived on the moon in the *Astronaut*. Since the air is entirely invisible, a maximum of the solar rays are received during the day; but during the long lunar nights, this heavy blanket of air retains the heat for a long time and the temperature never falls as low as 68 degrees F. below zero, which has been recorded on the earth.

The heat of mid-day is enormous, but it has been greatly exaggerated by terrestrial astronomers, who say it is hot enough to melt sulphur (288 degrees F.). As a matter of fact, I am not prepared to give the maximum temperature ever recorded; but I never heard of its being too hot for human endurance, provided the periods of exposure were reasonably short.

Scientific progress at this period was amazing. Necessity is the mother of invention and the Selenites, who knew that their future existence must be artificial, knew the full meaning of necessity. At three points on the surface, the rays of the sun were captured, transformed into energy and transmitted to the caves, where they were again transformed into light rays, which resembled the natural terrestrial daylight on a cloudy day. At the crater known to our astronomers as Tycho, an abundance of strange glass-like material was found; which we at first thought rock-crystal, but later found as not identified as any substance of our earth. From this material, millions of lenses were made, for the capturing of the sunlight. The largest of these solar power plants was located at Tycho, while two others were located on the other side of the moon, one near each edge of the vast depression. Except

for a very brief time, the rays of the sun could be captured by two of these stations at the same time.

The secret of the control of gravity was learned during the same period. It was discovered that electricity, magnetism and gravitation are manifestations of the same power, the name of which has no equivalent in our language. By a small outlay of electrical energy, the weight of any object can be increased or decreased at will from ten times its normal weight to minus nine times its normal weight. In other words, one pound of any material can be made to weigh ten pounds or be reduced to nine pounds less than zero, which is the same as giving it a lifting power of nine pounds. Means of travel and transportation were revolutionized by this invention. It was not my original intention to describe any of the Selenite machinery, but to leave that to Lacey and Winters, who will duplicate these things in the near future. But we are all under oath never to reveal the secret for the control of gravity until permission is granted by the Supreme Council of Dunel.

Among the most noteworthy developments of this period is the discovery of a process by which any object, or any part thereof, can be made transparent. Invisibility is merely a perfection of this process. While it is costly, it was not without both its good and evil effects. It caused an increase in crime, which was offset by its value in surgery alone. Because of the harm caused by its possession in criminal hands, the Supreme Council made its use illegal, unless permission be granted by the proper authorities. When the Selenites began to make explorations of the earth, their space-flyers frightened the terrestrial inhabitants to such an extent that observation of their natural habits was impossible. When the space-flyers were made invisible, more could be learned of terrestrial conditions.

Disintegrating rays were developed and used for cutting out more luxurious apartments in the solid underground marble. Transmutation was developed to the point where all the necessities and the growing list of luxuries could be cheaply produced by synthetic methods. Education in the arts and sciences was soon the common property of every citizen. Synthetic food was highly improved, both in the perfect proportion of the required elements and in taste. The people no longer complained. probably due to the fact that no individual lived who knew the taste of natural food. Their records show that the palatability of synthetic food constantly improved until it reached its high state of perfection. But to a Terrestrial, who has never known anything but natural food, this high state of perfection is a negative quantity.

Illustration by Paul.

Disintegrating rays were developed and used for cutting out luxurious apartments in the solid underground marble.

Boredom!

MANY thousands of years have passed since the Destruction. The history of the Selenites is not entirely one of peace and progress. They are human beings, and no amount of culture and progress can eliminate human characteristics and emotions. As long as there are men, women and children, human emotions must endure. As long as there are emotions of love, hate, joy, sorrow, jealousy, ambition, greed, and others too numerous

to mention, dissatisfaction and unfilled desires will remain. As long as this is true, as long as the race exists, there will be trouble, wars, injuries and disorders. Wars for independent government and separation from the remainder of the race, wars for freedom from tyranny either real or imaginary, wars for the ancient crown of Zerko and wars for no cause whatsoever are recorded in the earlier ages of their history. Murder, thievery and all forms of lawlessness have still endured. Since the earth has had, and still has, trouble enough of her own, I have no intentions of describing any of these troubles in this brief history lesson. But in the years to come, they will be studied by our own people, who will thus gain a newer and greater vision of the psychological characteristics of *Homo sapiens*.

The amazing progress of the first twelve centuries following the Destruction did not continue indefinitely. This period was followed by another period during which the pursuit of pleasure was the prime purpose in life. The earlier generations had devoted themselves to making their world more pleasant for their posterity. When the posterity fell heir to conditions calling for but little effort on their parts, they proceeded to make the most of it. No monuments are left of the achievements of this pleasure-seeking age, other than a few games, plays and songs that still enjoy a small degree of popularity today.

The next age in the cycle of Selenite history is one of indifference. For thousands of years, it would seem that their progress was at a standstill. No great men were produced, whose names are still remembered; neither were there any improvements or inventions worthy of mention. It would appear to a Terrestrial observer that this age had grown tired of the mad pursuit of pleasure and an age of boredom was about to follow.

It was a gradual change from progress to amusement, just as natural as a workman laying down his tools and starting to play. The changes from pleasure-seeking to indifference, and from indifference to boredom, were just as gradual and natural. A hundred centuries after the destruction, the age of boredom was at its height. For the first time in the history of the race, conditions had evolved that approximated the popular conception of Paradise. A minimum of physical exertion was required to supply the needs of the population. Further study of the secrets of nature and science was useless; for there was nothing more to be learned. Their subjects were all exhausted and they had not courage to search for new problems! Their arts and music had now reached the point where there was no room for improvement. Their world had been explored from center to circumference, nothing remained to be discovered. Their needs had long been over-supplied and their luxuries were too numerous to even be interesting. Their sports and amusements no longer offered a thrill and there were no new games or amusements to be invented or discovered. How they must have been bored during this age! The literature of the period was nothing but a series of lamentations over the intolerable conditions of over-supply, idleness and lack of outlets for their energies.

New Interests

SUCH was the deplorable state of affairs when an adventurous group of thrill-seekers made the first voyage to Barlenkoz. After an absence of several years, they returned with amazing stories of a new and beautiful world that promised not only an outlet for their energies, but a new home for their growing population. At that time, the earth did not present the same geographical characteristics as the earth of today. The Sahara was still a sea and the Mediterranean did not exist. Just south of the vast Sahara Sea was the center of Vudu civilization. Hundreds of miles north of the Sahara Sea, in a great depression below sea-level, the site now occupied by the Mediterranean, was another Vudu center. During the preceding centuries, Barlenkoz had returned to an orbit almost in the plane of the orbits of the other planets; and the annual changes in temperature were almost equal to those of the present day. In the Equatorial regions, no changes in the seasons were noticeable.

Previous to this time, nothing is known of Terrestrial history. No one knows the exact problems encountered by the black race when they made their homes on the new world at the time of the Destruction of Dunel. How they overcame the effects of a superior force of gravity, which made them weigh six times as much as they did on Dunel, and trained their weakened muscles to carry additional burden, will always be a mystery. The Selenites have a theory, which is no doubt true, that the burden of the hardships were borne by the white and mixed races. Evolution, encouraged by changed conditions, no doubt came to their aid during a few generations, made them over, increased their muscular strength to an extent previously unknown and sacrificed mental vigor at the same time. At the time of the first exploration the Terrestrial branch of the human race was capable of physical exertions that surprised the Selenites. But they noticed among them one amazing thing; they had almost abandoned the practice of standing on their feet when an opportunity was offered to sit down. The unusual weight of their bodies called for more muscular effort than they cared to exert. But the most difficult thing to understand was the fact that this weakness of the muscles of the legs has never been overcome and, even to this day, none of the Terrestrials will stand on his feet for hours at a time, if this tiresome position can be avoided.

To one who has never known any conditions of gravity other than the terrestrial, that condition seems perfectly natural. When we first went to the moon, we found it necessary to use shoes with heavy lead soles and to carry weights on our bodies in order to move with any naturalness of action. In time these weights were discarded, a few at a time, until at last we were able to get along without them. During the last few years, we have not used them at all; but we always had a surplus of muscular power that was a marvel to the Selenites. Since our return, our condition is pitiful; we find it almost impossible to carry our own weight and even while sitting or lying down, the effect is very tiresome. But to the Selenites, conditions are much more severe; at no time can they rise to their feet.

Their weight of thirty pounds is very natural to them; but to increase it to one hundred and eighty produces the same effect as if a person weighing one hundred and eighty had his weight increased to one thousand and eighty.

This superior force of gravity was the only thing that prevented the Selenites from colonizing our world in the past. The hardships of exploration were lessened by the use of a gravity-controlled device, the effect of which was exactly opposite to the weights we used when we arrived on the moon. When they were able to move about in their spheres with a naturalness of action, they made an extensive exploration of our world. Stereoscopic motion pictures, in both sound and color, record the conditions as they were found at that age in the remote past. It was my original intention to include in this manuscript an account of the early explorations of our world. But, since The Universal News Syndicate is in a hurry to give my story to the public, and I must be in Washington just as soon the the President can assemble Congress in special session, I find that it must be omitted at this time. If it can be arranged, I will have those pictures of which I spoke duplicated and brought to the earth for public exhibition. But the Selenites are very slow, and years may pass before this is done. They are not recorded on celluloid film like our own movies; and there would be a long delay if they were to be reproduced in Terrestrial laboratories, since we have none that are prepared to do this kind of work.

It would seem that the best solution to this problem is the preparation of another manuscript, dealing with the early history of our own world before the dawn of our own records of ancient nations. This I promise to do just as soon as certain more pressing matters are taken care of; but, in order to preserve the novelty of the first impression, I shall mention here only such events as are necessary to an intelligent understanding of conditions as they now exist on our sister world.

History repeats itself. Events happen in certain sequences which vary only to the change of conditions of the various ages. I have already told of one cycle in Selenite history; the next age following that of boredom was an age of war between the two worlds, the result of which was the destruction of Vudu supremacy on the earth, the release of millions of white and brown slaves and a reversion from civilization almost to savagery among all branches of the Terrestrial human races. The destruction of the blacks might have been complete, had they not learned the identity of their enemies and carried the field of battle to the moon. The war was no longer a pleasure to the Selenites, who did not dare to leave their underground cities. The solar power plants of the moon, one of which was located at Tycho, were demolished. Vudu spheres guarded the entrances of all caves and fired upon every Selenite attempt to escape. This ended only after a siege of over a hundred years, during which the Selenites gave up all hopes of ever leaving their caves, and the Vuduites thought their ancient enemies had starved.

After this, the Selenites decided that war should be outlawed and all young men and women were taught that it is the most degrading of all pastimes. The effect of this propaganda has persisted through all succeeding ages of their history. Over thirty thousand years have followed without war.

In the meantime there ceased to be communication between the human races. Their languages had undergone various stages of evolution until conversation became impossible. In spite of the fact that war had been outlawed by the Supreme Council of Dunel, there arose groups animated by a desire to revenge themselves on ancient enemies. This took place without the knowledge or sanction of the Supreme Council, and a punishment of banishment to Barlenkoz, was given all offenders.

The Extension of Human Life

AFTER the first war between the worlds, during which the population of Dunel was greatly decreased, because of the destruction of their solar power plants and the lack of sunlight and ultra-violet rays, a period of progress and prosperity followed. During the second cycle of progress, inventions did not follow each other in such rapid succession. Consequently the age of progress lasted longer. The most noteworthy of developments was the prolongation of human life.

For a long time organizations had existed which were almost identical with present-day Terrestrial life-insurance companies. In almost all cases a sum of government credits (the Selenite equivalent for legal currency) was paid to the relatives or dependents of the insured at the time of death. In order to postpone death and at the same time postpone the date of payment, the insurance organizations did all in their power to prolong the life of the insured. This led to a scientific study of the causes of death.

Accidents, old age and disease were found to be the most common causes. Instruction in safety methods and the adoption of safety devices were all that could be done for the former. Old age was considered a necessary condition, provided by nature, to do away with those who had already propagated their kind, in order to make room for their posterity. At first, it was believed that it was impossible to do anything to remedy the evil and their entire attention was given to diseases, each of which was taken up and studied separately. Origin, causes, nature, effects and form of treatment of each disease were seriously studied. When certain diseases had been conquered, steps were taken to destroy every disease germ in their little world. This did not come about during one generation or one century. Ages passed before their unrelenting war against malignant bacteria was successful and every form of disease was wiped out. Thus was the span of human life doubled, due to the non-existence of the weakening influences of bacteria.

Encouraged by this success, later generations began to improve on the work of the pioneers of the movement. It was found that old age was caused by the improper functioning of certain parts of the body; to name these would be to name every organ of our bodies. In some cases, the liver and kidneys did not cast off the accumulating toxins, waste matter and poisons properly, causing all the tissues to harden and weaken. In other cases the

stomach and intestines did not function properly; but always a cause was found. At first drugs and stimulants were used with very good results; but nothing short of immortality could satisfy the scientists, who were just beginning to penetrate the surface of this new subject.

The use of invisibility made it possible to study the action of the heart, stomach, and other organs in conditions of perfect health and all degrees of imperfection. Minor faults, that would have otherwise passed unnoticed, were detected and corrected, keeping every organ of the body at its highest point of efficiency. It was found that the human body is like a machine in many respects. In the case of machinery, worn and defective parts can be discarded and replaced; the same is true of the body, but not exactly in the same sense. Nature discards and replaces old and dead cells, thereby rebuilding defective tissues, strengthening defective organs and keeping them functioning properly. As long as the parts of any well-built machine are working properly, they do not wear and the life of the machine is greatly increased; the same was found to be true with the body.

Food was found to be responsible for many of the weaknesses and for centuries it received much careful study and attention. This resulted in the periodical examination of each individual for the purpose of ascertaining how his food was agreeing with him. Each person was given an individual food prescription, calling for certain quantities of starch, fat, proteins, vitamines, minerals and other required elements. This was his prescribed diet, which he was compelled to eat to the exclusion of everything else, except a prescribed amount of pure water at certain intervals. By the time this system was perfected, the span of life had been extended to four or six hundred years.

But with the years added to human life, a new danger arose. The people no longer died after reproducing their kind, according to the plans of nature, and there was no room for their posterity. The population was increasing to the point where it was impossible to take care of the increase. They were confronted with the necessity of a choice between abandoning the new system and regulating the number of births. The scientifically-regulated birth-control has been described in an earlier chapter of this manuscript. The internal disorders and rebellions that followed its adoption were the most serious in the history of Dunel; they represented the death struggles of a class deemed unfit to propagate their kind. But by the year 80,020 S. D. (my own abbreviation for Since the Destruction) the population had been regulated to the extent of keeping the births in proportion to the decrease by deaths, without any serious rebellions on the part of the undesirable classes, who were denied the privilege of reproduction.

By permitting no one to reproduce until late in life, long life was made a natural racial trait among the Selenites. During seventeen hundred and sixty centuries that have followed, the ancient methods of prolonging life have been constantly improved until the present time, when periodical surgical operations for the correcting of physical organic imperfections are a part of the routine of life. It has reached such a degree of perfection that, today, it is seldom a single person can be found who has not always enjoyed perfect health. It is not uncommon for a person to live 1400 years, having never during his life known the sensation of sickness or even the toothache. My own set of false teeth caused much interest among the Selenites; but no less wonder than that experienced by me when the teeth of an old man of over 1300 were submitted for my examination. To my surprise there had been no extractions, no abscessed roots, no cavities, crowns or fillings; it was a perfect set of teeth! It is due to the knowledge and skill of these Selenite surgeons that I, an old man of another short-lived race, have been restored to my youth, with prospects of centuries of life ahead of me, if I return at the proper time and continue the treatments; but even the Selenites themselves have no idea that my life can be made to equal their own. At present I am in constant fear that I will contract some terrestrial disease that will put an untimely end to my promising career. I have been breathing terrestrial atmosphere now for two weeks and, for the first time in ten years, I am suffering from a bad cold.

The Downfall of the Blacks

I FIND it impossible, in a brief manuscript, even to outline the events of each cycle of the history of the two worlds. In a future work, this will be done. But, at present, I will simply point out the radical differences between the development and evolutionary changes of the two worlds. On Dunel, existence has depended upon scientific knowledge; while on Barlenkoz, it has depended upon muscular strength, fighting ability and warlike tendencies. On both worlds, the survival was that of the fittest. On Dunel, the scientist survived and the fighter perished; on Barlenkoz, the black race of scientists degenerated to the most primitive conditions of savagery, due to their inability to cope with strange carnivorous animals, strange diseases and powerful, rebellious slaves; until the white race of fighting slaves at last came into supremacy. On Dunel, each cycle was complete. There were ages of progress, followed by ages of pleasure, boredom and dissatisfaction which continued until some disaster or radical change was brought about; after which necessity demanded activity and progress followed. It was a case of building up, utilizing and then tiring of former achievements; ending in destruction, which was often caused by internal rebellions and building up again. On Barlenkoz, it was a case of trying to keep a great civilization from falling to pieces. Progress was achieved through warfare, by plundering weaker nations. Africa was at one time the center of Barlenkozian culture; but this could not endure against an overpowering host of enemies, consisting of torrid climate which produced disease and laziness, remnants of life that once roamed over the earth when she was a member of another solar system; and the most powerful of all enemies, savage cave-men, escaped slaves carrying on an existence of their own through the power of their muscles and the cunning of their dormant minds. Added to this was a race of intelligent men from another world, who disobeyed their own laws and raided the helpless black cities,

using invisible space-flyers and disintegrating rays. The blacks were surrounded on all sides by enemies, many of who were unseen. What civilization could endure under such conditions?

At last there came a day when their unseen unknown enemies in invisible space-flyers destroyed their cities and their people by the millions. Only in the depths of the luxurious jungle vegetation could they find safety from unseen foes. Only by primitive means could they continue to survive. This was the end of a great civilization. Will it be rebuilt in the future? Will the blacks ever again rise to supremacy? Is there a fate in store for the white race like this? Who knows? History repeats itself. One race can not always be dominant. No doubt the blacks will never again rise to power, but the supremacy will go to another race, probably one of the mixed yellow or brown races, whose origin we have already seen.

After the overthrow of black supremacy, less than fifty thousand years ago, the Selenites no longer saw any immediate danger from the "Big Menace." The extreme gravitational conditions, the dangers of contracting terrestrial diseases, and the lawlessness on the part of the explorers, who did not consider themselves under the jurisdiction of their Zerko when they were on another world, caused the Supreme Council to prohibit any further explorations. But the interesting things of the new world were not forgotten. As each Zerko came to the throne, it became one of his first duties, either to send an exploring party to Barlenkoz, or to conduct the exploring party in person. At times, the crown prince was permitted to make the exploration just before the coronation, if he wished to do so; and thus relieve himself of the necessity of leaving his people after he had assumed the duties and responsibilities of a Zerko.

These explorations were made at intervals ranging from twenty years to five hundred. Motion pictures recorded everything of interest. These pictures are still preserved and form a part of the education of the Selenite youth. From these records it is possible to trace the migrations of all the prehistoric nomadic tribes and thus fill this great gap in our history. The time arrived when their records show Atlantis, populated by whites of a criminal class banished from Dunel, as the greatest terrestrial civilization. At times it looked as if certain people of a mixed race in China would be the dominating race; at other times India held great promise. Early Egypt, with scenes of the building of the pyramids, monuments and cities, is fully recorded.

Actual scenes taken from ancient Babylon and other cities long reduced to dust and forgotten, give a better knowledge of conditions than the few records in our possession. At a later period, cities of Persia, Egypt, China, Greece, Atlantis, Yucatan and Peru show a steady degree of progress. But one thing was observed in all records of Terrestrial exploration, that was very distasteful to the Selenites, who had long ago decided to abandon warfare. No exploring party ever returned without pictures of Terrestrial wars. It appeared that the Terrestrial branch of humanity was degenerating into blood-thirsty nations and some day Barlenkoz would be a genuine menace; if the Barlenkozians ever reached the point where they were able to cross the great barrier erected by Nature to isolate small worlds from their more powerful and warlike enemies.

As Others See Us

THE desperate hand-to-hand combats of the early Greeks and Persians, which are remembered today on earth as examples of ancient bravery and glory, are shown to the Selenite youth as examples of the depths to which men may sink when passions of hatred and greed go unchecken. The glories of Rome do not appear glorious at all to a civilized person when he sees the Roman legions wading through the blood of their victims, dragging their captives behind their chariots or making them fight each other in the arena for the entertainment of idle patricians. The beauties of the architecture of Athens and Corinth pass unnoticed by the Selenite youth while the wretched havels of the plebeians are pointed out to them as examples of Terrestrial conditions, only a few of their generations ago. The character of a nation may be determined by their favorite forms of amusement and the scenes of the Roman arena give the young Selenites an idea of the character of the dominating Terrestrial nation, only three lifetimes removed.

The lack of scientific development and improvements in the living condition of the masses, the blood-thirsty and degrading practices everywhere in evidence, caused the Selenites to consider a race of copper-skinned savages on the Western Hemisphere the most admirable race of Terrestrial humanity.

The next exploration after the detailed study of Rome convinced the Selenites that the white race was fast degenerating into a savagery as low as that of the blacks. Roman grandeur was destroyed. Greece was in ruins, Babylon had perished. Egypt was in a state of corruption and degeneracy. India and China had made no progress except in their numbers, and this was considered by the Selenites anything but an improvement. Atlantis had disappeared. The Incas and Aztecs, while developing along different lines, were about on a par with the Europeans.

During the ninth year of his reign, 490 years ago, in the year of our Lord 1465, Zerko Tarkomas in person led an expedition to the earth. There were few changes since the former expedition, and he was convinced that no danger would ever be encountered from "The Big Menace" during his lifetime. He saw for himself that all progress had been made in warfare and none in science. His expedition found that a certain mixed race had increased in numbers, as well as in warlike tendencies, and had now spread over a very large territory. He believed that these dark-skinned invaders would overrun all of Europe and become the dominant race; but that was not of sufficient interest to the Selenites to warrant any further investigation.

The prevalence of disease and unsanitary conditions all over the world and the lack of knowledge in preventing the most common of diseases was the

primary reason for placing us in quarantine, immediately upon our arrival upon his world, where thousands of years had been spent in the eradication of diseases of all kinds. He had assumed, judging by the past, that but little scientific improvement had been made on the earth during his reign. He was surprised at the progress and developments, which I described to him during our first interview. He could see that we were telling the truth and, during the last eight years, his opinion of us has been changed; but he could not get rid of the idea that we were of an inferior race.

When we were first placed in charge of our private instructors, I tried to impress upon our party the necessity of doing all in our power to prove that we were equal to them in every way. We found our studies very difficult and I firmly believe that we were worked as hard as possible, just to see if our mentalities were capable of absorbing their teachings. When we mastered our assigned tasks, we could see that a favorable impression was being made with our tutors, who made reports to the Supreme Council, as well as to the public. This was the result for which we were working and the reward we desired.

When we first began our studies, George Davis was still in a hospital, where he was being treated for the serious burns received while in quarantine. Upon his release he was not taken before the Supreme Council, but was placed in school with us. He was not capable of making the same progress with his studies, because of a lack of education before he left the earth. The remainder of our party were all graduates of our best universities; but Davis had not even completed high school work. He had spent one year in a business college before taking up newspaper work; and one can see that he was unable to carry the work assigned to us. Consequently, he was placed in a class by himself, where he did his best, until he surprised not only the Selenites, but ourselves as well.

The Sacrifice

DOROTHY Brewster's progress was a marvel and we three men had all we could do to maintain the traditional masculine superiority. To be perfectly honest, I am compelled to admit that, for once, we let a woman beat us.

We were not together at all times. Our instructors would send us to various communities to study certain things, and we were often in the company of Selenites exclusively. We were always spoken of as Barlenkozians; which, at first, implied about the same reproach as the word "heathen" carries in our country. But we have given the word a new meaning which is quite in contrast with their former conception of Barlenkozians. To change a national attitude toward the characteristics of another race has been found almost impossible on the earth; but I do think Barlenkoz now stands so much higher in their estimation that their former established prejudices are entirely refuted. I want to impress upon my terrestrial readers the necessity of maintaining the reputation we have tried to create; for our prestige among them is by far a more valuable asset than can be realized at present. Our relations with the Selenites in the future will be of a nature profitable to both worlds, and the most important thing is to convince them that our world is no longer a "menace" to them.

During our work in their schools, we determined to work twice as hard as we had ever done in any terrestrial university, in order to make a showing that would compare favorably with the work of the young Selenites. It did not take us long to make an important discovery, which proved very valuable to us. Education is compulsory for all Selenite students, before they can be admitted to citizenship. It is very seldom that anyone is denied citizenship, and their students know it. I have had enough experience with the students of Belmont to know all their tricks of bluffing the professors and shirking their work. It surprised me when I learned that the Selenite instructors tolerated these conditions, and graduated students that were far below the required standard. Because of laziness on the part of both students and tutors, their progress is slow, so that it not surprising that fifty years are required to complete their education. The ignorance of many Selenites about the very subjects emphasized in school is noteworthy.

Scientific subjects compose the greater part of their curriculum, and these are taught and studied in about the same way as our own dead languages. Interest is lacking, and original uses for old scientific principles are not encouraged. We found many facts that have never been exploited and developed and, when we told our instructors of new uses to which they could be put, it aroused no interest. They are taught and studied with the same indifference as that shown by an engineering student when he attempts the declension of a word in ancient Hebrew. They are not living in a progressive age and original thought is not encouraged.

When we saw the indifference of their own students, we were encouraged. Not only were we able to come up to their standards, but we had no difficulty in making a record that will stand for some time as an example of what can be accomplished as students. After seven years of the hardest work we had ever done in our lives, our education was pronounced complete. After a ceremony in which we were graduated and admitted to citizenship, we received the congratulations of the Supreme Council and our many friends, who no longer constantly reminded us that we were of an inferior race. Since we had the start over Davis, he has a few more years to spend before he becomes a citizen; but he is progressing very nicely and may even be able to break the record that we have set for him.

We were now ready to select the professions we chose to follow, and take up our duties as apprentices until we were masters of our professions. Winters insisted upon being a chemist, and Lacey thought himself capable of becoming a greater inventor than Edison. I had almost decided to become an instructor and try to speed up the educational methods, while Miss Brewster had never mentioned her plans for the future.

After Zerko Tarkomas had informed us of the decision of the Supreme Council regarding our disposition we considered it final and made no further effort to secure permission to return to the earth.

My greatest regret was the decision regarding the marriage of Prince Baklo. It was my personal opinion that the time would come when Baklo would renounce the throne, marry the woman of his choice and take up the life of a private citizen. This had been done in the past, and I felt sure that it would soon be done again. When I discussed the matter with Miss Brewster, she told me that Baklo had sugggested this procedure, but she could not permit it. She had told him that, if he should refuse the highest honor his people could give him, she would not have him as her husband; for the time would surely come when he would regret the sacrifice. She reminded him of his duty to his world, and told him that she would always be happy to remain a private citizen if she could see her lover on the throne of his fathers and know that her sacrifice had made this possible.

During the years in school, she had apparently given up her ideas of matrimony as hopeless; but I could see below the surface and knew the suffering she tried so hard to conceal. Occasionally we heard from Baklo, but his messages were very formal and brief. They contained nothing that he would object to have published to his people. At times I thought he had forgotten his love affair; while she proved her mettle by appearing to be pleased to know that he was not suffering the pangs of a hopeless love.

Baklo's Decision

SOON after we had finished our work in school, Dorothy proposed a trip of exploration over the lunar surface. Lacey and Winters did not care to go, for they were too busy making plans for their future careers. I was glad of the opportunity, as I wanted to visit Mare Crisium and see those strange Flat-footed Selenites. We secured a small gravity-controlled sphere and started at the beginning of the long lunar day. We decided to follow the illuminated hemisphere around the little world and return almost six terrestrial weeks later, when the sun would be dropping below the horizon at our starting point.

We were alone on this trip and took turns sleeping and handling our sphere. We enjoyed the trip immensely; for this was the first time in years that we had seen the sun. I shall not attempt to describe the entire trip, nor our amusing adventures with the "bideens" or Flat-footed Selenites. As we crossed the Sea of Serenity, Dorothy pointed out the spot where she had seen Baklo marooned years before. She pointed the way and I directed our craft to Mount Despair. Tears were in her eyes as she pointed out the high rock, behind which she had seen Baklo rest just before the fire that had destroyed the Brewster Observatory. She was living the cruel scenes over again, and my heart ached at the thought of her dangerous voyage across space in the *Astronaut* and the present hopelessness of her love for Baklo.

We moved over to Mount Despair and came down to an elevation of about two hundred feet. As usual, the day was very hot and the windows of the sphere were all opened. We stopped to examine the sealed entrance of the cave; when suddenly we heard a voice below us among the rocks. We recognized the song as one popular among the Selenites, and the tones were strangely familiar. A few minutes later the voice began singing in English:

"Dear one, the world is waiting for the sunrise;
Every rose is covered with dew——"

"Who is that?" I asked: "It can't be Davis, Winters or Lacey."

"The thrush on high, his sleeping mate is calling——"

The rich baritone voice continued.

Dorothy seemed to be awakening from a trance, her blue eyes sparkled; a blush came to her face and a new radiance that I had not seen for years came over her. "I'd recognize that voice anywhere," she answered as the singer continued:

"And my heart is calling you."

"Baklo!" I exclaimed, as I recognized a characteristic difficulty with the last high note: "Where is he?"

My question was answered before it was spoken. Dorothy had seized the control of our sphere and had brought it to the ground. Cautioning me to be quiet, she stepped out and moved silently and swiftly among the rocks toward the singer, who was just concluding the last line for the second time.

"And my heart is calling you." Dorothy sang as Baklo had finished.

Baklo turned around with a startled, but happy expression on his face:

"Dorothy! Have you come to rescue me from my melancholy thoughts?"

"Do you need rescuing as badly as you did when I first found you here?"

"I need you more than ever," he cried as he took her in his arms. "You have been on my mind continually since we parted eight years ago. Here at this spot, where we used to be together, I can find peace. Let us stay here for the remainder of our lives; let me renounce the throne so we can marry. We will never find happiness until we do."

"And we would never be happy if we did. If you married a Barlenkozian you would be disgraced."

"Let us take a space-flyer and go to your world; we would not be disgraced there and we would find the happiness to which everyone is entitled."

"Baklo! I am ashamed of you! You will soon receive the crown of your fathers. For years you have been prepared for that high office. Would you betray the trust they have in you? Do you think we would ever find happiness at that price? Before I would permit anything like that, I'd take my own life; and in the years to come you would find another to take my place in your affections."

"No one can take your place in my affections. If I live for twenty centuries, I shall never marry again unless I marry Mother Earth's Fairest Daughter."

CHAPTER VIII

A Conspiracy

THE remainder of the conversation of the reunited lovers must remain untold. As soon as she saw Baklo, Dorothy had forgotten all about me, and Baklo was too interested in her

even to notice that I was in their company. It was a case of three being a crowd; so I decided that the strange lunar vegetation should occupy my attention.

After spending hours examining certain brown vines and grasses, I decided that the sun was too hot for intensive research; so I went back to our sphere and went to sleep. I was aroused some time later by Baklo calling me to come over and join them.

"Dr. Haverfield," Dorothy began when I had joined them, "how would you like to sit down to an old-fashioned dinner like we used to eat at home?"

"Don't joke with me, Dorothy," I replied: "It requires all the will power I have to eat these synthetic cakes. When I think of roast beef with baked potatoes, or pie and fruit, my diet becomes so terrible that I can not eat it."

"I am not joking with you; I mean it. Would you be willing to enter into a little conspiracy with Baklo and myself to get our supplies out of the cave in Mount Despair and give a banquet to the Supreme Council?"

"I'd be glad to help, but I have my doubts if there is anything there that is fit to eat after a period of ten years. I doubt if the Supreme Council would let us touch anything from the earth that is full of terrestrial microbes."

"Baklo and I have been discussing the matter, and we have decided that it will be worth the effort. He has been talking to the Zerko and several of the Buzerks about barbecue sandwiches and oranges; and their curiosity has been aroused to the point where they are actually anxious to sample natural food. As for their qualities of preservation, you will remember that I bought the best grades I could find before the *Astronaut* started for this world. Furthermore, I had a special order filled which called for extreme care in their preparation, to insure their preservation for a long time. For ten years they have remained in a dry, dark, cool place; and I am positive that enough materials are in good condition to make a splendid banquet for the Supreme Council and their wives. What do you think of the idea?"

"You may think me selfish, but why do you want to banquet the Supreme Council? They were very selfish when they refused to let us return to the earth and they were not very kind when they prohibited your marriage. Why can't we keep our food for our own use?"

"Would you rather do that than return to the Earth?"

"What would the banquet have to do with our returning to the Earth?"

"Perhaps nothing at all—and perhaps it may be such a thing that they will send us back to the Earth to get them more natural food."

"I begin to understand. The plan sounds interesting and the experiment may be worth trying."

Some time later it was learned that Baklo had taken the matter up with the Supreme Council and permission had been granted to secure the food supplies and give the banquet, provided certain precautions given by the proper authorities were taken.

This plan called for selected criminals to enter the caves and carry outside the boxes and barrels, which were treated with a heat ray to destroy any bacteria that might remain. This, of course, destroyed the paper cartons and some of the wooden boxes, but the barrels stood the test very well. They were placed in a separate compartment of the sphere and carried to a location on the other side of the moon, where they were immersed in boiling water. When this operation was completed and the boiling water was drained off, they were considered sanitary and we were permitted to touch them.

An examination of the sterilized containers showed us that about ten percent of the canned fruits and vegetables would have to be destroyed, as they did not look any too good. A barrel of flour was apparently as good as the day it left the earth; the two barrels of corned beef were in excellent condition. The hams and bacon had dried out a little too much and smelled strong but, with the exception of being tough, they were still in edible condition. Of course all the fresh fruits had spoiled; but they had dried up rather than rotted. Considering our desire for food of this kind, they could still be eaten and relished.

We four Barlenkozians were authorized to prepare the banquet. Davis secured permission from his instructors and volunteered his services, which we were glad to accept. This was a new experience for Lacey and myself; but we knew a little more about it than the Selenites. Miss Brewster is an excellent cook and, under her direction, we tackled the job with an enthusiasm that would make a French chef turn green with envy.

Orders were given for plates, knives, forks, spoons, dishes and cooking utensils, which had to be made for the occasion. These articles were entirely unknown to the Selenites who, for over two hundred thousand years, were accustomed to eating nothing but cakes of synthetic food, which came to them wrapped in paper, and were eaten with their fingers. It was an interesting experiment for me. No one could foresee how they would react under these conditions. My former experience had shown me that the Supreme Council was the very personification of dignity. I had assumed that they carried this dignity with them at all times and, like terrestrial kings, tried to maintain their traditional superiority in private life. I did not consider the fact that Prince Baklo had always treated us as social equals and that months had passed before we knew that he was of the royal family. I forgot that Dunel is unlike any terrestrial nation in government. The Zerko and Supreme Council are both more autocratic and more democratic than any of our rulers or lawmakers. In the council chamber their dignity and power is absolute; in private life they are on an equality with their neighbors, with whom they participate in games and other amusements.

Had I taken this into consideration much of our trouble and much of our fun would have been lost. If I had spent as much time in worrying about their ignorance of terrestrial etiquette as I spent in worrying over my own inexperience in serving royalty, the banquet would have progressed differently. I imagined that their scientific minds would appreciate the opportunity to study and learn ter-

restrial habits. But I was soon to learn that they were men of the same sort one meets every day at home, men who do not care to be educated when they expect to be amused and never seek an education while seeking pleasure. Their own ancient records, which told of the race when it lived on a diet of natural food and found pleasure in eating, together with Baklo's description of barbecue sandwiches, were no more significant to them than the description of red or purple to a blind man. I do not mean to say that the sense of taste had perished; but they could only imagine that a new and exquisite pleasure awaited them at the banquet.

A Royal Banquet

AT last everything was prepared. Long tables and chairs were arranged in an orderly manner; but the scene presented the appearance of a military mess-hall, rather than a banquet room for royalty. The guests arrived. Thomas Jefferson riding a black horse to the capitol on inauguration day was a royal, autocratic figure compared to these hundred per cent. democratic lawmakers. I had expected Zerko Tarkomas to lead a royal court, something like that of Louis XIV; but the royal arrival was more like that of a crowd going to a prize fight.

There was but little difficulty in getting the guests seated. It was my intention to serve but small portions of each food separately, and give an explanation of its origin and preparation for use. I thought this would be interesting to them; but they were seeking pleasure and not information. We had accepted the offers of several of our Selenite friends to act as waiters, but they were very inefficient. They could not remember the order in which the food was to be served. One ambitious waiter served apple pie as the first course, another selected ice cream, which was made from canned condensed milk. Another, who had been assigned to the table where Zerko Tarkomas was sitting, came in with generous helpings of boiled corned beef. It was my first experience in serving royalty, and I was interested only in doing my own work properly and observing the effect on my guests. I did not notice what was going on elsewhere. I was busy demonstrating the use of the soup spoon when suddenly there came a scream from one of the ladies' tables, where ice cream was being served. One of the guests had not even taken the trouble to wonder what the spoons were for and had started to eat ice cream in the manner in which she was accustomed to eat synthetic cakes. The ice cream was a trifle too cold, or too slippery, or something; but at any rate it proved uncontrollable, slipped from her fingers just as it reached her mouth and fell into the loose folds of her low-necked dress. Pandemonium reigned in that end of the hall until Dorothy arrived on the scene and led her from the room, where the difficulty was removed.

Zerko Tarkomas was gazing at his corned beef with the attitude of an American who is being served horse flesh. He suspected that it was the flesh of some animal and did not know whether to eat it or not. He saw that his friends were eating it and enjoying it; so he summoned bravery enough to taste it. It must have met with his royal appetite; for when I next looked at him, he was eating corned beef just as a small boy eats watermelon.

As I glanced at the table where apple pie was being served, I saw that the Selenite waiter was having trouble of his own, but for a different reason. Apple pie is handy; it may be eaten either with a fork or, as our royal guests preferred, with nature's own equipment. But one piece of pie did not last very long; for the guests refused to take a chance on soup and were clamoring for more pie. Rather than offend them, the waiter served more pie, with the result that all the pie was being consumed at one table.

The Selenites knew no more about proper eating than does a terrestrial child, the first time his mother places him in a high chair. They were very hungry, but they were unable to distinguish between the different kinds of food. If the first sample was satisfactory, they could see no necessity for a change to something that might prove to be inferior. We have seen what happened when pie was served; the same was true of ice cream, fried ham, corned beef, soup, bread, cakes, and canned fruits and vegetables. Their only name for the different varieties was the equivalent of "Natural Food." Zerko Tarkomas ate nothing but corned beef; the queen had fried ham, and after the banquet, both thought they had eaten the same thing. Ten years earlier, Baklo had refused to eat anything but barbecue pork sandwiches, oranges and pie. At the banquet he did not get a chance to eat anything but baked beans; after which he informed the other guests that natural food was much better when eaten fresh. His statement was true; but he did not know that the beans he had just eaten had been brought to his world in bags, in a dry uncooked condition and had been baked just before the banquet. But as for fresh food, I doubt if the average American housewife would have considered these ten-year-old canned goods fit for her table. Its age, however, did not make any difference to the Selenites, who were eating it with gluttonous appetites.

The banquet was progressing nicely, if one considers nothing but the enjoyment of the guests. But, to a master of ceremonies, everything was out of control and it was impossible to restore order. Our guests were clamoring for more food and our waiters were trying to supply the demands. There were only six of our guests who registered complaints and they had genuine grievances—their waiter had served them nothing but olives. It had not been my intention to serve olives at all; but one waiter knew only that they were food and not that one must acquire an educated taste before olives can be appreciated. He did not hesitate in taking a half dozen jars, our entire supply, and serving them to six Buzerks who were showing they were hungry. These guests ate the olives, but decided that natural food was less palatable than their own synthetic cakes.

I was trying to convince the guests seated at my table that we had something to eat besides soup (they had found it handier to drink from the plates than to bother with awkward spoons), when George Davis came to me with a very important question:

"Is there any danger of too much corned beef hurting anyone?"

"There is danger in too much of anything; what's wrong now?"

"Just look at that old fellow over there! That makes seven hunks of corned beef larger than his fist! I can't make him stop eating, and I'm afraid he will kill himself!"

"That is Zerko Tarkomas, the king of the moon," I replied: "This banquet has gone far enough! Tell the waiters to stop serving! Our guests will kill themselves."

"It's a pity to make them stop so soon," Davis replied: "They've only been eating for eight minutes."

"Seven hunks of corned beef in eight minutes! They must stop at once!"

"It's eight hunks in eight minutes, Doc," Davis replied, evidently thinking it was very funny: "The old king has eaten another hunk while we have been talking."

CHAPTER IX

On Trial

THUS the banquet ended. Our fun was over and our troubles started. Their veneer of civilization was at least four centuries thicker than our own; but on this occasion, culture had been thrown aside and only an unsatisfied primitive hunger remained. Countless generations who had longed for the food provided by nature, inherited dissatisfaction with synthetic food, combined with customary indiscretion in the pursuit of pleasure, had caused them to forget everything but the demands of an appetite for something, they knew not what. It was only by forcibly removing all the food in sight, which was almost as hard as taking meat from a hungry lion, that the banquet was brought to an end.

The next session of the Supreme Council was the biggest failure since its organization. Only thirteen Buzerks were able to attend, and they were in no condition to discuss the affairs of state. The only thing accomplished was a denunciation of Barlenkozian food as full of malignant microbes; almost all who had eaten it were sick with some loathsome Barlenkozian disease. It was decided that the offending Barlenkozians should be imprisoned under charges of "either knowingly or unknowingly, attempting to murder the entire Supreme Council and their wives and releasing malignant microbes of some unknown variety among the people of Dunel."

In our prison we had a chance to think things over. It was now certain that our last straw of hope for returning to the earth had vanished. We received no news of our guests and had nothing but guess-work to tell us how many of them would die. A few hours before we had thought the banquet a humorous affair; now grim tragedy stared us in the face. Would irate citizens storm our prison and mob us? If they did let us live to appear before the Supreme Council, what punishment would the victims of the banquet see fit to give us? Would their ancient hatred for Barlenkoz influence them to such an extent that justice would be denied us?

It seemed like a lifetime before we were ordered to appear before the Supreme Council for trial. The big question in our minds was the number of fatalities. As we were led into the Council Chambers, my first impulse was to count the number present. I soon saw that this was going to be a difficult task, so I began looking for empty seats. To my astonishment, I saw none. But this proved nothing; for each community council always had a Vice-Buzerk ready in case of the absence of the Buzerk, to make sure that their community council would always be represented. I saw no new faces and none of those present appeared to be sick. But their expressionless faces concealed their thoughts and there was no indication of the emotions beneath. Zerko Tarkomas presided in all his royal dignity. This was encouraging, since our greatest fears had been for his personal health. When we were seated, he rose to his feet and addressed us:

"It is with regret that you Barlenkozians, to whom we owe so much, are thus summoned before the Supreme Council of Dunel. I take no pleasure in telling you that you have been charged with attempting the murder of the entire Supreme Council and their wives, and releasing malignant microbes of some unknown variety among the people of Dunel. What have you to say?"

"We are not guilty," I replied as I rose to my feet: "We are sorry for the ill effects produced upon you. Had we foreseen the results, we would have never asked for permission to give the banquet. We are anxious to know the number of fatalities."

"Due to the efforts of our best scientists, who were able to remove the foreign matter from our stomachs, no fatalities resulted. They were ordered to make an analysis of the food and to search for malignant microbes. Fosog, one of our best authorities in the matter of food and digestive hygiene, is now ready to report."

This was the first time I had ever seen the famous Fosog. He was over twelve hundred years old, but did not appear older than a Terrestrial of forty-five. His entire life had been devoted to the subject of proper food production and the care of the digestive organs. I had always wanted to meet this famous character; for he was the only present-day Selenite of whom I had ever heard who did not try to avoid an argument. A mental combat is rare in that world; they do not like to argue, though to me a good hot argument is the spice of life. From all reports, Fosog was a man after my own heart. No one dared dispute anything he said, and he had found no difficulty in rising to the head of the department of food production almost one thousand years ago. When William the Conqueror first invaded England, Fosog was one of Dunel's foremost scientists. During the reign of two Zerkos he had supervised the production of food. He had a deep respect for his own importance and knew his own subject better than any of us; but he was entirely lacking in a sense of humor.

Fosog's Report

AMID enthusiastic applause, Fosog rose to his feet to deliver his report:

"We find no bacteria in the natural food, other than certain harmless varieties common on Dunel. We are of the opinion that the heat ray and the

boiling water, with which we ordered the food to be treated before the banquet, are responsible for the destruction of Barlenkozian microbes. The few bacteria that we did find must have entered the food since that time. We believe that the illness of those who ate it was caused by a natural fact that requires some explanation:

"These Barlenkozians, as you all know, come from a race that is our intellectual inferior. To compensate for this mental weakness, Nature has given them greater muscular power and stronger digestive organs. This fits them for the natural conditions of their own planet. Just as Nature has equipped all the lower animals with digestive organs capable of extracting food units from coarse grasses and other raw vegetation, the Barlenkozians have been provided with stomachs capable of digesting this kind of food.

"We find Barlenkozian food unfit for Selenite stomachs. We ask that laws be passed immediately, forbidding our people to eat it. Although we did not endanger our lives by tasting it, we do not doubt that it is more pleasant to the sense of taste than our own. But we have a remedy for that. These strange, pleasant flavors can be produced by artificial means and added to our food, which has been proven perfectly adapted to our use. We can then enjoy the flavors of natural food without exposing our stomachs and other vital organs to unnecessary dangers. I shall now pause until you have passed the laws for which I asked. I will then conclude my report."

There was great applause and excitement from all the Buzerks who lost no time in passing, unanimously, laws prohibiting the use of Barlenkozian food by all Selenites. But since it had formerly been our natural diet, we were permitted to use it as long as our supply should last.

During this delay, George Davis whispered to me: "Doesn't old Fosog think he is the whole works? Wouldn't you enjoy making a monkey out of him?"

"I would indeed enjoy it!" I replied: "He appears to be tottering under ideas of his own importance and our own inferiority. I consider it an insult of the first magnitude to speak of Terrestrials as an inferior race with stomachs like lower animals. If I get a chance to answer him this Supreme Council is going to hear something that will show them which is the superior race. I can hand out insults just as fast as Mr. Fosog, if he wants to lock horns with me."

"Dr. Haverfield!" Dorothy interrupted: "You'll do nothing of the kind! You will say nothing to offend or insult anyone. I have plans for a more effective humiliation of this super-scientist of a super-race, and a complete victory over the Supreme Council. Just wear your muzzle a little longer. Then we will all charge this wolf pack together and, for the first time in his life, Fosog will find himself in the midst of a real argument."

"There is no time like the present," I told her.

"Argument overruled. If you get a chance to talk, don't forget your dignity and don't get offensive. We have not yet started to fight."

Fosog began the conclusion of his report with a denunciation of natural food: "It is small wonder that the Barlenkozians lose their teeth, after eating such food. It is responsible for their diseases, against which we have tried to protect ourselves. I am not surprised that they never live for a single century. Their energies are all consumed in digesting coarse foods, unfit for human stomachs. The results of our analysis of this food are surprising. Eighty per cent. of the samples examined were composed mainly of water! In some cases, starch was entirely lacking and in others there was nothing but water, starch, salt and undigestible matter. Fat, of a poor variety, made up the bulk of other samples. The work of separating the food from the undigestible matter is enough to exhaust the resources of any digestive system in half a century.

"But the most surprising thing about Barlenkozian food is the attraction it has for bacteria of all kinds. If bacteria of disease were present in our atmosphere, as they are on Barlenkoz, this food would have caused the death of those who ate it. You owe your lives to me; for it was I who demanded that this food be treated with the heat ray and boiling water before you used it. Furthermore, it was due to the supreme effort on the part of my department that your stomachs were emptied of their loathsome contents. Less than one dirumo after the banquet, bacteria of decay had entered the remainder of the food and the odor produced prohibited further investigation without the use of a mask. If this is the only diet of the Barlenkozians in their native state, they are unworthy of membership in the human race. I want to warn the Supreme Council against accepting invitations to dine with beings of a lower class. If you receive an invitation from the flat-footed bideens to share their diet of vines and grasses, do not accept it."

We could not suppress a laugh at his conclusion. We thought it was intended as a joke, but Fosog was never more serious in all his life. Neither did the Supreme Council see anything funny about it. I never saw such a lack of a sense of humor. Zerko Tarkomas asked me to explain our amusement.

"I was simply laughing at the ignorance of Fosog," I replied.

"Who are you to speak of my ignorance?" Fosog demanded.

"I am the man who can give you instructions about food of all kinds. If you had asked for information in the first place, you would have never made such an absurd and ignorant report. Barlenkozian children of six years of age know more about——"

I did not get to finish my answer. I was stopped by my own party, who forcibly placed me in my seat with orders to be silent, while Miss Brewster did the talking.

The "Brewster Grit" Again

"I WILL ask you to forgive the insults of my friend, Dr. Haverfield. It is one of his failings that he is unable to control his emotions when someone makes what he considers a mistake. He once had the reputation of being one of the most forceful talkers of Barlenkoz. He enjoys an argument. Mental combat is his favorite sport and he has never yet been defeated. He comes

from a race of fighters and from a world of strife and combat, both mental and physical. When angered, Dr. Haverfield is more than the equal of a score of normal men. I must apologize for his conduct.

"I will attempt to explain his objections to the very intelligent report of your capable scientist. We Barlenkozians do not consider any one food perfect. Our diet includes small portions of different kinds. At the recent banquet, we were unable to control our guests, who did not know the dangers of eating one food by itself. When one has learned the taste of different foods, the sense of taste tells what should be eaten. Even with our strong stomachs, we never eat until entirely satisfied. At the banquet, each of you ate enough for four Barlenkozians. With your own food, you never make this mistake. Your overworked stomachs were the cause of your discomfort, not the nature of the food. It is unfair to compare our diet with that of the bideen. You have no appetite for grass and raw vegetation; but natural food is the best that nature could provide for our race. The fact that you enjoy it as well as we do, proves that it is adapted to your use as well as our own, provided it is eaten in the proper proportions and in small quantities. At Mt. Despair, your crown prince ate it exclusively and suffered no ill result. Any Selenite can do the same.

"As for its attraction for bacteria, we must admit that Fosog was not mistaken. But we always prepare our food but a short time before it is eaten, and never attempt to preserve it for an entire dirumo (two and three fourths terrestrial days.)

"I am pleased to learn that Fosog intends to give your synthetic food a natural flavor. I will be glad to assist him in any way possible to insure his success. Our own scientists have always been unable to duplicate the work of nature, but the superior ability of Fosog insures an improvement in the taste of your food."

Fosog replied without thanking Dorothy for her apology. He advised against the experiment of giving a Selenite what he considered a perfect dinner. He said he had found injurious elements in natural food that would shorten the lives of those who ate it. He again promised to give synthetic food a natural flavor and asked them to wait not longer than five dirumos (two weeks) when their diet would have a natural flavor. He declined without thanks Dorothy's offer to help and again expressed renewed confidence in his own ability. He asked for samples of food with which to experiment and Dorothy gladly promised to furnish them. We were released of the charge of attempted murder; Davis was sent back to school, and we were free to do as we pleased.

Even though I had been denied the privilege of an argument with Fosog, I felt certain that there would be all the argument I cared for from our own party. But I was mistaken. Lacey agreed with me that Dorothy did the wrong thing in offering to help Fosog. Winters said it would be a simple matter to make artificial flavors and wondered if Dorothy thought she was speaking the truth when she said our own chemists were unable to imitate natural flavors. If Fosog were successful, there would be no need of commerce with our world and the banquet would have been a total failure. We did not know where Dorothy had gone after we left the Council Chamber, and it was a long time before she joined us.

"Boys, we have started to fight!" she cried as she walked into the room where we were sitting: "The first battle was a complete victory. If we had rehearsed our parts for a year, we could not have done better. It will not be long until you are offered free passage to the earth and I will become the future queen of the moon."

"You have a lot of confidence in yourself. How do you expect to do this?"

"When my father first proposed building the telescope at the Brewster Observatory, he was told that it could not be done. But he did it. I was told that this trip to the moon was impossible, but with your help we did the impossible. We Brewsters have a family tradition. The 'Brewster grit' never fails. It is characteristic of our family never to give up when we once start a task. The 'Brewster grit,' is again aroused! We have started something and the most powerful weapons of the earth are at our disposal. The barriers ahead of us are small in comparison with those we have already crossed. Within a few lunar days, I will be married and you three men will be back home where you will be considered the greatest heroes of all time."

"What do you consider the most powerful weapons of the earth?" I asked.

"Napoleon once said nothing could withstand a resolute determination. Hannibal considered strategic leadership his greatest weapon. Shakespeare said the earth had no force that could withstand a scheming woman. What was it that caused Columbus to lead the first expedition across the Atlantic? It was the human desire for the spices of the Orient. Any one of these forces is enough to insure our success; but we have them all at our command."

"But," Winters objected, "the Supreme Council once made a final decision that we were never to return to the earth. There is no hope that they will remove their decision; they have the reputation of being a very immovable body."

"Yes and the 'Brewster grit' is an irresistible force. An irresistible force is about to collide with an immovable body, and something is sure to happen."

"Did you forget that Fosog is going to make artificial flavors?"

"Do you know where I have been since we left the Council Chambers? I was preparing something for Fosog to imitate. You remember he said he had never tasted natural food and that is the reason he needed samples. I prepared some for his use and sent them to him. These samples consisted of biscuits flavored with castor oil, Worcestershire sauce, condensed milk to which gasoline has been added, and a bar of soap."

Gathering the Evidence

THE time arrived when Fosog had promised to give natural flavors to synthetic food. In triumph he carried his product to the Supreme Council. Full of anticipation and expectancy, the Buzerks prepared to make gluttons of themselves again. But their disappointment was plainly shown when they tasted the result of Fosog's experiment. Their confidence in his ability and science was not shattered by the first mistake he had ever made during his long life. He was

asked to try again, but each successive experiment was a failure. The Buzerks thought they could not wait until natural food had been produced by synthetic methods. They came to us, one at a time, and asked us to bootleg the forbidden food to them. Dorothy always warned them of the dangers pointed out by Fosog and, in most cases, they replied they had come to the conclusion that the famous scientist was, for once in his long life, a failure. She reluctantly consented to give them the food, provided it was eaten in our presence and not carried away. Without their knowing it, Winters and I secured photographs of these Buzerks breaking the laws they had themselves unanimously passed.

Fosog and his entire department continued their attempts to make good on their promises. Time after time, they called upon us for samples of food; but each sample had been prepared in advance for that particular purpose. After two lunar days, they were ready to acknowledge their failure, for which we expressed regrets as sincere as those of the Supreme Council. Dorothy sent word to the Supreme Council that she believed she could succeed in the experiment in which Fosog had failed. They gave her the opportunity. Fosog and his department prophesied her failure, but she mixed ground spices, such as ginger, cinnamon, nutmeg, etc., and liquid flavoring extracts with the ingredients of the cakes and her product was a success. She sent her cakes, of which there were a score of different flavors, to the Supreme Council.

She became famous immediately. The Supreme Council honored her, her friends congratulated her, while Fosog and Company, whose humiliation was complete, wanted to know how she had done it. She explained the use of the spices and flavoring extracts and took particular care to let it be known that these were to be obtained in abundance on Barlenkoz. She saw that samples of her product was given to many of the most influential citizens, before letting them know that her supplies were almost exhausted. She knew that price is governed by supply and demand; so she created an enormous demand before telling them that there was no supply, because the price she was going to demand would be enormous.

Time passed slowly; our business of bootlegging prospered as long as our food lasted. Without knowing it, each guest left not only his name on our register, but undeniable photographic evidence of his breaking of his own laws.

CHAPTER X

The Zerko Relents

FOR the third time in our lives we were summoned before the Supreme Council. That body had just finished one of the longest and most important sessions on record. We never learned what had happened before we arrived; but we have reasons to believe there had been more arguments and debates at that session than ever before. Fosog had been present and his opinions had been heard (of that we are certain), but it will always remain a mystery to me that they decided to act against his advice. As usual, Zerko Tarkomas was the first to speak. He told us of the decision made on the great problem that not only concerned us, but all the peoples of two worlds. His speech lasted for over two hours, but I shall try to condense it into as few words as possible:

"Friends from Barlenkoz," he began, "you are again summoned before us to hear our decision on a request made by you a long time ago. You asked for permission to return to your native planet. We realize the danger it brings in letting your warlike hordes know that ours is not a dead world, but one of the most desirable habitations in the entire universe. We realize that we or no other group of men can stand in the way of progress. We realize that, if your recent wave of progress continues for another century, your people will find out for themselves the conditions that now exist on our world. It has been decided that the best thing we can do is to make ourselves known to your people and secure an agreement during the present generation that will safeguard our interests and bring a real benefit to the posterity of both races.

"We are asking you, not permitting you, to return to Barlenkoz and tell your people the conditions as they now exist. We ask you to tell them of the history of your race and ours before they were divided and let them know the bond of relationship that exists between us. Tell them that, in the future, the resources of both worlds may be necessary, as they have been in the past, to repulse the invasions of creatures foreign to both of us, who may attempt to take our worlds from us.

"You may tell them that we desire to create commerce between the two worlds as the first step toward reuniting the two races. The laws which we passed when you first arrived upon Dunel, prohibiting the successful landing of Barlenkozians upon our world, have been replaced by laws more just and humane. We will permit men and women of your world to come here, upon the condition that all such immigration shall be regulated and controlled by the Supreme Council. We must insist that all precautions be taken to prevent your people from bringing Barlenkozian diseases with them. Every person will be required to spend a certain time in quarantine before mingling with our people. The secret for the control of gravity must remain a secret of our world and all space-flyers, as well as all commerce, must be under our control until disease has been banished from your world, as it has been from ours.

"Do you agree to these conditions and promise never to reveal the secret to your people?"

We replied that, in our opinion, each nation and each world is entitled to make its own laws concerning immigration. We agreed to keep the secret for the control of gravity, and do all in our power to make their immigration laws respected by our people. We told them that we believed our government would agree to these fair conditions; but we did not have the authority to make any promises binding our government.

"We feel that you can be trusted," continued the Zerko: "In all your acts and conduct while in our midst, we never knew of your being dishonest or guilty of any act that would deceive any of our people."

I wondered what he would say if he knew of the trick we had played on Fosog, by making his experiment a failure. I began to wish we had not tricked this well-meaning old fellow; but, when I think that if we had not done so, we would probably still be on the moon, I feel that the end justified the means.

"Since there are many languages spoken on your

planet, we have decided to conduct all our business with your world through your own nation, the United States of America. We do not want the other nations and peoples of your world to feel offended by this; but the existing conditions of confusing languages makes this necessary at the present. In the years to come, when languages are better understood, negotiations will be opened with all the peoples of Barlenkoz. We feel that your nation will be fair and just with her sister nations and we wish to say here and now, that if they are not, there is another nation of your world that speaks the same language.

"Dunel now faces an important change in internal conditions. Within another year the ancient crown of all the Zerkos will be passed to my son, Baklo. I feel proud when I say the reins of government are passing into capable hands and the crown will rest on a worthy head. During my reign, great changes have taken place for the better among my people; but greater changes have taken place on Barlenkoz. If Baklo reigns as long as I have done, he will direct one of the most important periods in human history. Your nation is in the midst of the most progressive age that ever existed; it is the wish of the Supreme Council that this progress shall continue and nothing shall ever happen to check it or cause a war between the two worlds. Both worlds will profit by the opening of commerce, but your profit will be the greater. All we ask at this time is natural food, to be used in connection with our former diet. Fosog still advises against it; but other members of his department are of the opinion that a little natural food, now and then, will strengthen our digestive organs and be a physical benefit to our race, provided no radical and sudden changes are made in our diet.

Fosog Strikes Back

"IN return for periodical cargoes of food, we will give you any materials or articles you may ask. We think, however, that our scientific knowledge will be of more benefit to you than anything we have to offer. We cannot give this all at one time; we will have to educate a number of your young men and women and let them return and teach their fellow-countrymen. When you return, you will carry much of our knowledge and science with you. With the few exceptions that we deem necessary, we want you to give this knowledge to your world. Send us a thousand of your young men and women and we will educate them and return them to you, capable of doing much good among your people. We can not send our own teachers to you; for they would not only be encumbered by the strong gravity of your planet, but they would be more susceptible to your diseases and their lives would be endangered.

"Every ship of space that crosses the void between the two worlds will tie us closer together. We will communicate with you from time to time while you are on Barlenkoz, and I am sure that I express the sentiments of all our people when I say I hope you will soon return to us. Even though you are our intellectual inferiors, our people have learned to love you. Your progress in your school work is pointed out to our young people as examples worthy of imitation. In order that you may prolong your lives and make the most of your restored youth, it will be necessary for you to return to us for periodical treatments; so, when you return to your world, we do not consider it a permanent separation."

The approval of the Buzerks was plainly shown by their applause as their Zerko took his seat, but there was one man present, to whom these plans were very displeasing. This man was Fosog, unquestionably the foremost scientist of Dunel. His recent failure had been a great humiliation to him, and his loss of prestige with the Supreme Council had been a terrific blow. His long list of successful achievements had given him a sense of personal importance that was very distasteful to us. But, for the first time in his long life, he had suffered defeat. He knew how to win but had never learned how to lose. He held the Barlenkozians responsible for his failure and his hatred was directed toward Miss Brewster, a member of an inferior race and an inferior sex, who had accomplished a task that he had declared impossible. He knew that this was his golden opportunity for revenge, and was determined to defeat the plans of the Supreme Council, which were such a decided benefit to a hated and inferior race. As he rose to his feet and asked for permission to address the Supreme Council, I formed the opinion that he was a worthy antagonist and hoped the opportunity would offer itself to meet him in mental combat.

"The greatest mistake in human history has just been made," Fosog began: "The Buzerks have not only degraded themselves, but have dropped to the level of the Barlenkozians. I believe there was something about the filthy natural food, that not only has such a disagreeable taste, but unknown qualities, capable of producing such a degenerating influence upon those who eat it. It is responsible for the barbaric and warlike tendencies of the Barlenkozians. Since eating it, the Supreme Council has acquired their objectionable qualities. If all the Selenites eat it, our race and our world are ruined. Dunel is in the greatest danger since Barlenkoz first appeared in our skies; the Supreme Council has become the enemy of the people whom it has sworn to serve and protect. There is but one man who can save our world from this great menace—I am that man. For a thousand years I have unselfishly served my beloved fellow-citizens. It is I who saved the lives of the Supreme Council after they had filled their stomachs with the most terrible foreign material that was ever dignified by the name of food."

I realized that the time had come when Fosog must be answered. If he were permitted to continue, all our work would have been in vain. The Supreme Council would listen to him and withdraw their offer to let us return to the Earth. But Fosog continued:

"The degrading influence of Barlenkozian food is shown by your offer to give the most valuable possessions of our world, scientific knowledge and mechanical achievements, to the Barlenkozians. With new weapons, their barbaric tendencies will be stimulated. In less than a decade, Dunel will be invaded by vast hordes of barbaric Barlenkozians. No one but a fool or a traitor would give weapons to an enemy. The Supreme Council is composed of both! For the sake of the people of Dunel, I demand the immediate destruction of the five Barlenkozians in our midst."

"That old fool has gone far enough!" I said to my companions: "It looks almost as though the Buzerks are going to agree with him. If Zerko Tarkomas does not silence him, I'll do it myself!"

A Denunciation

BUT the Zerko made no effort to silence him and Fosog continued: "No one has made a deeper study of Barlenkozian conditions, as revealed by past explorations, than I. From one exploration to another, no scientific progress has been reported. During my career, Barlenkoz has been explored twice and, if Baklo does his duty and explores the menacing world at the beginning of his reign, it will be found that conditions are exactly the same as they were when his father made the last exploration. These Barlenkozians tell us they are civilized, but they forget that we are of a superior race, quite able to use our minds and judge the future by the past. We know their qualities and their limitations. They may act like civilized men, but under the surface they are exactly the same sort of brutal wild men who roamed over their world only a few centuries ago, barbaric and warlike, incapable of donning the garments of civilization."

"These insults shall not go unanswered," I whispered to Dorothy: "For your sake, I have remained silent in the past, but no one can keep me muzzled in the future! Fosog must be answered at all costs!"

"It will not be long now," she replied: "Just wait until he finishes."

"War is glorious to these Barlenkozians," Fosog continued. "This group wants to return and boast of the new world they have discovered. They want to be heroes and will lead an expedition against us. What would be more natural for the woman to boast of how she corrupted our world by giving us that terrible food? She knows she will receive more hero-worship than any other woman of her race. She will——"

Baklo had risen to his feet and raised his hand in protest. This was an indication that the speech of Fosog was at an end: "The insults uttered by Fosog are a disgrace not only to his department, but to the Supreme Council as well. They must cease entirely. If he has anything worth while to say, he may continue; but we are not here to hear him insult a woman."

"You are just the person to say that!" Fosog retorted: "Your immoral love affair with this barbarian woman is not the secret you think it is. If you could have your way, you would share the throne of Dunel with her. You have been plotting together against the Supreme Council! You proposed the banquet at her request in order to corrupt the Buzerks and defeat their purposes for your own selfish interests! You are——"

Dorothy was crying! Lacey and Winters were ready to fight and I was preparing to tell Fosog something that he had never suspected. Fosog was ignoring Baklo's gestures for silence, when Zerko Tarkomas intervened and succeeded in silencing him.

"It is pitiful," said the Zerko, "that Fosog behaves like a madman. If he proves unable to act like a sane person, it shall be my duty to remove him from office and submit him to an examination to see if he is suffering from the insanity of old age.

"I want to apologize to Miss Brewster for Fosog's conduct. I am certain no one believes her guilty of immoral conduct of any kind, as charged by Fosog. As for her desire to return to her native world, we consider that only natural, and are certain it is not for the purposes mentioned by Fosog."

"But I have no desire to return to Barlenkoz. My interests are all here on Dunel. As long as Dunel continues to revolve around Barlenkoz, I hope to remain here."

She had made a mistake in saying anything about their world revolving around ours. No Selenite likes to have his world belittled in that manner; the entire Supreme Council appeared to be angry. Fosog saw an opportunity to make use of her mistake:

"I want it distinctly understood among you Barlenkozians that Dunel does not revolve around Barlenkoz, but the two worlds revolve around their common center of gravity. Here is added proof of the ignorance and conceit of the Barlenkozians."

"As I was saying," Dorothy continued, "as long as Dunel continues to revolve around Barlenkoz——"

"But Dunel does not revolve around your big Barlenkoz and never did!" the enraged scientist shouted. "Do you not know the meaning of 'Center of Gravity?'"

"Dunel revolves around Barlenkoz and has continued to do so once every dirdir since the destruction. Fosog may have an influence with the Supreme Council, but he is unable to interfere with the laws of Nature. Do not worry about my ignorance about the meaning of 'Center of Gravity'. Check up on your own ignorance as to the location of this center of gravity. You know the weight of Dunel, the weight of Barlenkoz and their distance from center to center. Use your science, a few figures will teach you something that the distinguished Fosog never knew."

I never saw such a mad scramble for pencils and paper. Each Buzerk wanted to be the first to arrive at the truth. Though I knew Miss Brewster's statement to be true, the exact figures had escaped me. I made a hasty calculation and estimated the center of gravity was located at a point less than three thousand miles from the center of the earth and the radius of the earth is four thousand miles. While the moon does not revolve around the exact center of the earth, she revolves around the earth nevertheless.

"Solar Heat!!" exclaimed Tarkomas, when the truth dawned upon him. "The girl is right and for thousands of years we never thought of it. I do not believe our scientists degenerated so far as to never check this thing. Why have they never made this public? Generations have lived and died without knowing this! Judging by the emphasis placed upon the center of gravity, I always thought it was located about half way between the two worlds and they revolved around each other. Fosog must beg Dorothy's pardon for saying her race is inferior to his."

As Shakespeare would have said, this was "The most unkindest cut of all." Fosog had no choice in the matter; he obeyed his Zerko, but his humiliation was complete. Silence now reigned supreme as Dorothy handed me a piece of paper, upon which an important message was written in English:

"Consider the muzzle removed. Borrow all the thunder of Jove and let your conscience be your guide."

CHAPTER XI

The Thunder of Jove

I LOST no time in rising to my feet and asking for permission to address the Supreme Council and answer some of the charges of Fosog. They must have been expecting action of this sort, as there was not a dissenting voice as my request was granted by Zerko Tarkomas.

"My friends," I began, "since our arrival upon your world, we have always been spoken of as members of an inferior race. The time has come when you must

realize that educated Barlenkozians do not acknowledge the supremacy of any other race. Our lives and our entire resources have always been pledged to upholding our honor and rather than acknowledge any other race or any other world as our superiors, we would gladly perish. No effort has been spared to let us know how we are rated in your estimation. You have shown us our world as you have seen it. I hope to do the same for you and let you see Dunel as we see it.

"We thank your Zerko for his kind offers to educate our people and raise us up to your own level. In return we will assist you in trying to become our equals. We know that your intentions were good; we hope you can say the same of us when I have finished."

I now held the undivided attention of the entire Supreme Council. They had no idea of what was coming. When Dorothy spoke of my love for a mental combat, the last time we appeared before the Supreme Council, she had paved the way for this occasion. Things were going our way and we knew it; every time I noticed an expression of fear, I used heavier artillery and more direct forceful arguments.

"Why is the Supreme Council not honest to admit that their sudden desire to educate our race is due to fear of a race superior to their own? Why not admit that you fear the scientific secrets you are offering us, will be discovered by our own scientists during your own lifetime? You know that we have made more progress during the past five hundred years than any other nation or race has made during any thousand years of human history. Five hundred years ago, Zerko Tarkomas saw our people living in miserable hovels. Today you see the posterity of the same people, who have solved a problem that baffled you for ages, the problem of interplanetary travel. You know that our rate of progress is so great that you momentarily expect to find Dunel covered with gravity-controlled space-flyers from our world. In order to act before they make this discovery themselves and make them think the secret is so baffling, you try to tell them that they are not yet civilized enough to have such dangerous things in their possession.

"You know the character of our race and their ability as fighters. Fosog says we are barbarians. We are proud of the fact that we are not cowards like the people of Dunel. You boast of the forces that influenced the evolution of your race and produced a race of semi-scientists and weaklings. You know the evolution of our people from the same common ancestors. In the past ages you have seen the conditions and influences that have made us a race of fighters, while your own ancestors were living lives of ease, splendor and idleness.

"Your expeditions to our world before the dawn of our history have recorded the struggles of our fathers, fighting for an existence on a world not adapted to their race. You have seen the heroic struggle against a superior force of gravity, and when your own people were unable to stand on their feet, our children were walking at less than one year of age, which is more than can be said of Selenite children, in their own native world. You have seen the extinction of the saber-toothed tiger, before the fearless advances of our fighting ancestors. You have seen a struggle for existence in a world where only the strongest and fittest could survive and live to propagate the race. In selecting her breeding stock, Nature was more severe and selected sterner stuff than any of your scientists. Our weaklings died in their infancy and our cowards never lived to reproduce their kind. What is the result? On Barlenkoz, not on Dunel, live the race of supermen!

"Our ancestors fought against the superior brawn of Barlenkozian animals and were victorious because of their superior intellect. You know the kind of training they had to develop their minds. The intellect of our race did not perish with the civilization of the blacks, which was destroyed by your own cowardly race because you feared them. As our people rose up from savagery, they received a training that has been denied you. Nature has trained our people and produced a race superior to your own, which is the product of human science. Humanity can not equal the products of Nature, which was demonstrated when Fosog attempted to give synthetic food the flavors of nature.

"When Fosog attacked us a short time ago, I thought he would be a worthy antagonist. He has the reputation of being your greatest scientist and a man who had never been defeated in mental combat. He proved to be unworthy of consideration. He offered nothing but insults, without any sign of reason or proofs. I was disappointed in his entire speech; I had hoped he would give us something to answer. But he defeated his own purpose with his unreasonable insults. He did not win a single Buzerk to his side. He is said to be your most able talker and fighter, against whom no Selenite can argue. I consider him a big bluff, who would have no chance against a Barlenkozian.

Haverfield Speaks Out

"HE told you we were his inferiors, but failed to mention anything in which his race was superior to us. Your young men and women require fifty years to complete their education, before they are considered citizens and capable to begin life as an apprentice. Handicapped by a lack of knowledge regarding your language, we Barlenkozians completed the Selenite course of instruction in seven years. Our companion, George Davis, had never completed the Barlenkozian education and was not considered a well-educated person at home, but he is doing far better than his Selenite companions. We are educated in the arts and science of both worlds and are able to compare them, since we know both. We will say that you have many scientific facts of which our people are ignorant, but you are entirely lacking in the ability to make use of them and produce new inventions. Your thousands of years of civilization are almost lacking in progress. Pleasure has been the main purpose of your existence and your race has long ago reached the point of stagnation. Your cycles of history tell your story, your periods of progress are short compared to your periods of pleasure seeking, boredom and indifference. Your ancestors made life easy for you and you have done nothing but enjoy it; instead of advancing, your race has gone backward. Stagnation has followed your progress and retrogression has followed stagnation. Your population of today is a disgrace to your ancestors of the first thousand years following the Destruction.

"Compare these conditions with those of Barlenkoz. Physical development was necessary immediately after the Destruction. Scientific knowledge was sacrificed for something more necessary at that time; but, at a later period when the slaves of the black Barlenkozians were rebuilding the lost civilization, your own cowardly people destroyed that civilization and left the few survivors with nothing but their physical strength and keen wits to cope with the dangers of their world. You

know the story. It does not need repeating; but today our present generation is the heir of ages of physical development and a slow but certain process of intellectual progress. We are advancing while you have been going backward for ages. The facts are before you; answer for yourselves: Which is the superior race?

"We will comply with your request to return to our world and send you food. Our nation has never yet refused to send food to starving people of a less fortunate race. You offer us all the gold and rare metals we desire. We desire none! Keep your gold, your copper and your silver. Keep your radium. It is true our supply is limited, but you have no more than you need and are unable to produce more. We do not care to take advantage of you. But we will accept a quantity of another metal that is so common that transmutation is not necessary to produce it—platinum. We can take it without injury to you and we appreciate it just as well; but we ask only enough to exchange for the food we intend to send you until we return to Dunel.

"We will tell your history to our people. We will describe your conditions as you requested. We will go before our own Supreme Council and talk in your behalf. We will do all in our power to have your immigration laws respected and obeyed by our people. We will give none of your inventions to our people against your will. We will give them only the scientific principles you desire them to have; but you must not hold us responsible if they have already made these discoveries during our absence. Ten years is a long time, considering the short lives of our people; and many new discoveries and inventions are produced each year. I doubt if they will welcome and appreciate new inventions from your world. They are living in an age of progress and have much to work for. These are the conditions that produce real happiness and that is preferred to an age of pleasure-seeking.

"We will send you any amount of food you desire; but please remember that the President of the United States and his own Supreme Councils, who express the wishes and desires of the citizens, will regulate the future commerce between the two worlds. They will decide what you will send us in the future.

"You may banish your fears of Barlenkorian microbes. We know all your methods of fighting germs and do not consider them much more effective than those used by our own people. The only difference lies in the fact that you have the results of thousands of years of effort, while the task, which is infinitely greater on our world, is only started. We will see to it personally that all food supplies sent you are treated for the extermination of all kinds of bacteria before they leave our world. If you will use your usual precautions upon their arrival, there will be no danger.

"But before we do any of these things, there is one thing you must do. Some time ago your Crown Prince Baklo asked the Supreme Council to approve of his marriage to Dorothy Brewster. His request was denied because you considered it unwise to mix the blood of an inferior race with your royal family. Have I not proven that race is superior to your own in every way? Do you not see the absurdity of your attitude? Do you not consider it the best thing that could happen to your royal family, to mix its blood with that of a superior race? Do you think you can keep this splendid couple apart forever? She crossed a barrier that we believed had never before been crossed, to rescue him and restore him to you. She crossed a greater barrier than that when she demonstrated the fact that she was superior to any woman or man of your race. If any other barriers stand in her way, she has the ability to break them down.

A Last Threat

"THE accomplishments of her family are greater than those of the Royal Family of Dunel, even if we compare an equal number of generations and give you the benefit of ten times as many centuries. Her forefathers were among the earliest pioneers of her country. They helped to make our nation possible; they fought the red men whom you admired. Your admiration was, no doubt, caused by the fact that they, like yourselves, had reached a point of stagnation where no further development and progress was possible.

"For centuries the Brewsters have been one of the greatest families of our country. No war has failed to find them among the leaders and no time of peace has failed to find them the foremost citizens. For generations, they were leaders and educators in the greatest colleges and institutions of learning in our world. By the sheer ability of leadership and shrewd management, her grandfather accumulated one of the largest fortunes of the country. With the aid of this vast fortune, the inventive genius of her father and the characteristic perserverance of her family, the Brewster Observatory was built, which makes it possible to see everything that happens on the side of your world turned toward ours. Her father accomplished something your greatest scientists have failed to do during the past thirty-five thousand years. She saw Baklo marooned on the desert surface of one of your ancient seas. Four years later she had organized an expedition, built our first space-flyer, crude as it was, and crossed the void between the worlds. You laughed at her *Astronaut* because you had superior gravity-controlled space-flyers, copied from a race superior to your own, the black Vuduites. But, within the same length of time, have you had a woman or man within the past thirty thousand years who was capable of constructing a new type of space-flyer and doing the same thing?

"No woman of your world has ever equaled her record as a student and no man has ever surpassed her. Her instructors have failed in all attempts to baffle her. She produced synthetic food with a natural flavor after Fosog had failed. Just now she has pointed out an error in the teachings of thousands of generations of your scientists. Do you still say she is unworthy to share the crown of the Zerkos with Baklo? What more do you require? The Supreme Council once selected a wife for Baklo, and what was the result? Let Baklo do his own selecting this time and you will have as your future queen and the mother of future Zerkos, Mother Earth's Fairest Daughter.

"You can not refuse to sanction his marriage to the woman of his choice; but I have a request to make. There must be no restrictions placed on the number of their children. They must be permitted to have as many as they desire. I am not asking you to approve of the marriage, I know you will be glad to do it of your own free will. But, if you refuse to comply with my request, I shall have a very painful duty to perform. I shall inform the Zerko that one of his Buzerks is guilty of breaking one of the laws he helped to pass.

Recently he came to us and asked for Barlenkozian food. He ate is and suffered no ill effects; but we have a photograph taken while he was eating it, which he can not deny. If I find that my request has been granted, this picture shall be destroyed and the honor of the Buzerks shall not be questioned. If my request is denied, then the citizens of a certain community shall see the sort of man they have chosen to represent them. They will not approve of a man who passes laws he breaks himself.

"We will now leave the Council Chamber and let you discuss the matter in privacy, but we will remain near the door so you may call us when you have reached a decision."

Baklo left the Council Chamber with us while the matter was being discussed. Just outside the door, he slapped me on the back and said:

"Dr. Haverfield! I am amazed! That was the greatest speech ever made in all our history! You have changed their opinion of you and your world completely. You will never again be spoken of as belonging to an inferior race. You proved yourself superior to any of them. Barlenkoz is now a bigger menace than ever, but their appetites will make them overlook that. But who was the Buzerk who ate the forbidden food?"

"We have eight hundred and twenty-seven photographs, showing the same number of Buzerks engaged in that form of amusement."

"I am amazed; You actually—er—what do you call it?—er—shot up the town. That is what they say on Barlenkoz, isn't it?"

"Dr. Haverfield!" Dorothy interrupted: "I was never so mortified in all my life! I never expected you to go to such extremes!"

"What's the matter now? I never thought you would object to my suggesting that the Supreme Council sanction your marriage."

"That's not it. That was humiliating enough; but imagine how I felt when you demanded that they remove all birth-control regulations in my case!"

"Dorothy, let me tell you something. When I objected to your bringing all that food with us in the *Astronaut*, you told me that the day would come when I would be thankful for those extra barrels of corned beef. It is now my turn to tell you that the day will come when you will thank me for making these demands."

CHAPTER XII

The Return of the "Astronauts"

WE had been waiting but a few minutes when we were surprised by the unexpected arrival of George Davis.

"What's it all about?" he asked in English: "Everyone is talking about the Supreme Council sending you home to get more food. The old banquet must have been a success after all!"

"We do not know yet," Lacey replied: "We think they are going to send us home, they did say something about it. Are you ready to go along?"

"Not on your life! I am going to finish school before I go back. I've just about decided not to go at all, if you can get along without me."

"Why not?"

"Well you see it is like this: There is a certain young lady who wants me to stay here."

"Oh I see! You are in love with one of these pretty Selenite maidens."

"That's it exactly. Wait until you see her; she is the prettiest and the smartest girl you ever saw."

"You mean with the exception of Miss Brewster," I added.

"No, Miss Brewster never liked me and this girl does. That's the reason she is smarter than Miss Brewster."

"Did you hear that Dorothy is about to be married to Baklo?"

"Don't kid me! The Supreme Council would never hear of it."

At that moment the door opened and a smiling Buzerk came out: "The Zerko would like to know if Miss Brewster and Prince Baklo desire an immediate wedding."

"We are ready," Baklo answered, "just as soon as my mother can be called."

"Your mother is here. Zerko Tarkomas sent for her as soon as you left the Council Chambers. That was the cause of the delay."

The wedding took place in the presence of the entire Supreme Council, Zerko Tarkomas officiating. The ceremony was shorter and differed somewhat from the Christian ceremony but, as I am not writing a love story, I will not describe it.

After the ceremony and congratulations, Dorothy announced her desire for the Christian ceremony. Baklo agreed to this, provided the Selenite language was used instead of English, which he did not understand very well. As captain of the *Astronaut*, I performed the ceremony. It was the closest personal experience I had ever had with matrimony, and it was necessary to read the ceremony from a little book Dorothy had brought from home for that very purpose.

When George Davis congratulated the royal couple, he asked Dorothy if she had brought any rice along. "No wedding is legal without it," he added.

"I did have some rice, but it was all used at the banquet. I forgot to save any for the ceremony."

"Well I hope you get some more before my wedding takes place. I wonder if you would let me have that little book. You do not need it any more."

"Certainly you may have it, but I hope you do not have to carry it around with you as long as I did. It will be worn out if you do."

"Where are you going for your honeymoon?" Winters asked.

"That's right! No wedding is complete without a visit to Niagara Falls. I shall speak to my husband about it."

The Supreme Council was anxious that we start home as soon as possible, because they were impatient to receive the first cargo of food supplies from our planet. Two spheres were made ready for the voyage as quickly as possible. One of these spheres was made invisible; for it was to be used by the newlyweds on their honeymoon visit to Niagara Falls and other points of interest in our world, and they did not care to attract any attention.

Dorothy and Davis made out a list of food supplies to be sent to them, while the remainder of our party made the final preparations for our departure. Davis insisted that a few cook-books be included in the shipment; as it would be his work to translate them into the language of the Selenites and teach them how to

cook and prepare the food. Dorothy thought it would be best to send nothing but canned goods; but, since so much depends upon the quality and the satisfaction produced by the first shipment, Davis assumed the responsibility of seeing that everything was prepared properly.

I had a lengthy conference with Zerko Tarkomas and Prince Baklo, in which plans were worked out for the establishment of commerce between the two worlds. If our government sees fit to indorse these plans, as they were submitted upon our arrival, they will prove a positive benefit to all concerned. The Selenites are not trying to take advantage of us in any way; and I have promised to do all within my power to see that their interests are protected and that nothing happens to give the citizens of either world a chance to complain. As yet, I do not know just how the plans will appeal to our people. There is a great task ahead of me which will begin just as soon as I go to Washington next week, as an ambassador from the Moon. If "Farm Relief" is still a problem remaining unsolved, I think it will soon be settled to the satisfaction of all concerned.

On Earth Again

AT last the time arrived when our return journey was started. Davis gave me a bulky manuscript to be given to his former employers, The Universal News Syndicate, telling of our voyage to the moon. This has already been published in the papers owned and served by that syndicate. He gave me also a bundle of personal letters to his friends, and asked me to inform his employers that he would return within a few years and write the conclusion of his story. Just to satisfy the publishers and the public until that time, he asked me to write an account of our personal adventures and give a description of conditions on that world. You are now reading the resulting story; and I have omitted enough to make a hundred stories as lengthy and as interesting as mine.

While we were talking, Zerko Tarkomas arrived and called Davis aside. They held a private consultation for a few moments, after which Davis called to me:

"Can you add an extra barrel of corned beef to that order for the Zerko?"

"If you will assume all the responsibility, and show him how to cook it, I will do so and include a crate of cabbage."

"I like it, too. We will have a private banquet of our own, and I will not let him eat too much."

I shall not burden my readers with a description of our return trip. The two spheres started together and the invisible sphere remained near us until we reached Niagara Falls. I'd like to describe our emotions when we first entered the atmosphere of our world, but that is impossible. Emotions such as this, must be experienced to be appreciated and understood.

The newspapers have already told you of the enthusiastic welcome that greeted the "Astronauts" as they visited the principal cities of the nation in the sphere in which we returned. You already know of the six tons of platinum, deposited in Washington. I wish I could describe the amazement of the Selenites when they first saw the Atlantic Ocean at close range, or when they received their first glimpse of the falls of Niagara. The Rocky Mountains and the Grand Canyon did not impress them very much; but, when they saw the orange groves and fruit farms of California, the effect of terrestrial gravity was all that prevented them from leaving the sphere and attempting to secure the natural food.

The effects of the superior force of gravity on the Selenites need no description. The Selenites of today are no stronger than they were in ages past; they are compelled to remain in their seats while near our world. We found that our absence of ten years had weakened us considerably. We are still more able to move than our companions, but it always seems that we are carrying an enormous burden. When I address the authorities in Washington next week, I fear it will be necessary to do so sitting down; for standing on my feet is a very wearisome task.

Our strange voyage is ended, but our work in establishing conditions favorable to the commerce between the worlds is only started. A greater task than this is the establishment of the advantages of Selenite science and inventions among our people. But, in this, Lacey and Winters have already taken the lead. If our government favors the idea, I will seek to get in touch with one thousand of the finest young college men and women in the country, who are willing to be sent to the moon for a course of instruction such as we have just completed. This manuscript will give these young people an idea of the adventures they can expect. Our achievements and reputation have given these wonderful people a high regard for our race, which we can not afford to jeopardize. No one will be selected as a student in this group unless I, personally, feel satisfied that he or she will uphold the good impression we have tried to give them. No one will be considered whom I do not feel to be attracted more by the opportunity to be of real service to both worlds than by hopes of personal gain. At all costs, this newly-discovered world must be protected against unscrupulous profiteers, who may try to exploit the Selenites and take a personal advantage of their desire for and ignorance of natural food, or their abundance of metals or other products rare and valuable on our own world. No reward in money is offered to the prospective students, who will be the only persons taken to the moon for some time; nor is there any expense connected with the trip. But the extra years added to life, and the opportunity to aid in the noblest and greatest task of all time is a reward, the equal of which was never offered before. Anyone interested in the enterprise may communicate with me at Belmont University, and arrangements will be made for an investigation and personal interview.

Dorothy's Last Promise

I CAN not close this narrative without mentioning a conversation I had today with Princess Dorothy and Prince Baklo, through a small radio set with which I can communicate with the invisible honeymoon sphere when it is within a radius of a few hundred miles.

Prince Baklo is greatly impressed with his visit to our world and hopes to return in the near future to begin his personal exploration. But at present he and his bride are anxious to return home; for the cargo of natural food may cause more work and trouble than Davis can handle alone. The princess thinks it would be unfortunate if the Supreme Council should

eat too much, and have to send for Fosog again.

"Yes, that is one thing we overlooked. You had better hurry back before it is too late. Have you any message to your old friends?"

"I suppose you are telling them that I am still alive, well and happy."

"I am; but have you any personal message to any of your relatives?"

"I have no relatives except my foster mother. If she is still living, you may tell her that she can not laugh at me any more; I've made good on my promise."

"What do you mean by that?"

"When I was only four years old, I cried for the moon and wanted to haul it in my little red wagon. Aunt Mary thought it was very funny and even in later years loved to laugh about it. I always told her that the moon is not out of reach if one had the grit to go after it, and that some day I would get it—"

"—and haul it in your little red wagon?" I asked.

"Perhaps."

"Well, be careful, Dorothy, and don't break it. It was too hard to get."

I am now ready to lay down my pen and bring this manuscript to a close. But years must pass before the entire story is told. As I now look out over the beautiful campus of Belmont, where I presided for over a quarter of a century, I do not experience the emotions of a man of seventy with a great task well done. Instead, I am looking forward with the enthusiasm of youth to the greater task just ahead. When that task is finished and the day arrives when the inhabitants of two worlds see the fulfilment of the vision of the poet of a century ago, when

"—the heavens fill with commerce, argosies of magic sails,
Pilots of the purple twilight, dropping down with costly bales;
When the war drums throb no longer and the battle flags are furl'd
In the Parliament of Man, the Federation of the World."

When that vision becomes a reality, I can then lay down my pen and at the close of the most beautiful and amazing story of all, write

THE END

The Next Science Wonder Quarterly

will contain the long-promised sequel to THE SHOT INTO INFINITY, another masterpiece of interplanetarian science fiction, entitled

THE STONE FROM THE MOON

By Otto Willi Gail

After the publication of THE SHOT INTO INFINITY in the Fall 1929, issue of SCIENCE WONDER QUARTERLY, we received a perfect flood of letters praising this story and begging us to get a sequel.

We have done this for our readers. We have imported from Germany, and had translated in America, Mr. Gail's second tremendous science fiction novel, THE STONE FROM THE MOON. We can go on record in saying that the sequel in our estimation exceeds, in its scientific construction, its dramatic adventure and strangeness of incidents, the original story. Not only does Mr. Gail give us scientific instruments which have never appeared in a fiction story before, but he has also cleared up for us many of the strange mysteries of our planet. He shows, with much vividness, that many of the things we had accepted as myths and "old wives' tales," were based on scientific discoveries of tremendous importance to our earth.

After the editors finished this story, they were left almost breathless from the sheer magnitude of Mr. Gail's conceptions. And this story, by the way, is as far different from the average interplanetarian story as gold is different from the alloys that resemble it.

In the Spring Science Wonder Quarterly

On All Newsstands March 15

The OSMOTIC Theorem

by

CAPTAIN S. P. MEEK

U. S. A.

Illustration by Barker

Imagine if you saw a solid column of water a hundred yards wide, fifty yards through and a mile high, shooting into the air at an unheard-of velocity. Such was the sight that greeted me!

I ENTERED Professor Hurlburt's study with a feeling of trepidation. Any one who knew the fiery nature of the mild-appearing man and the virulence and frequency of his outbreaks of sarcasm and who also knew the nature of my errand, would have readily pardoned my uneasiness. In fact, if Alice, who shared somewhat her father's obstinacy, had not been adamant, I doubt whether I would have ever pumped up enough courage to beard the lion in his den to the extent of asking him for the hand of his only child.

The Professor looked up as I entered and a smile played over his usually austere face.

"Come in, Lawrence," he said as he recognized me. "Your coming at this time is fortunate in the highest degree. I was about to send for you."

He smoothed back the sparse grey locks which emphasized the unusual height of his brow and came forward to grip my outstretched hand in friendly greeting. I was at a loss to understand his unwonted cordiality, a cordiality which extended to leading me to an easy chair and inviting me to be seated.

Fortunate in the highest degree," he repeated as he seated himself and put his finger tips together in his best lecture-room manner. "It was very considerate of you to come to me at this time."

I felt an inward qualm and wondered if he had an inkling of my mission. He was apt to appear most friendly just before the vitriol began to spit from his tongue, but his cordiality seemed real enough and I could detect no lurking trace of sarcasm in his tones. He beamed on me as I sat there; and the simile of a bird before a cat rose involuntarily in my mind.

"I come to ask a favor of you, Professor," I said with a good attempt at an offhand manner, "a very great favor, in fact."

"That's fine!" he replied, rubbing his hands together. "I will be more than glad to accommodate you if it lies in my power. Consider your request as granted and let me ask you a few questions. What do you know about the composition of the interior of the earth?"

"Why—very little," I answered, much surprised at the question.

"That I grant you," he replied with a smile, "but it does not answer my question. Do you know any single definite fact about it?"

"Why, yes—several," I said.

The smile took on a peculiar twist which I had learned to associate with the Professor's contempt for others.

"You do?" he queried silkily. "If so, you are an exception to the average run of mankind. But I doubt the truth of your statement. Please tell me a few."

Had it been anyone other than Professor Hurlburt who asked me that question I would have been inclined to take offense, both at the words and at the tone; but I did not choose to quarrel with Alice's father. Besides, Professor Hurlburt's manner was too well known for anyone to take offense at being called a liar.

"Well, for one thing," I replied, "I know that the interior of the earth is hot."

"How remarkable!" he exclaimed softly and I winced at what I knew was coming. "He *knows* that the interior of the world is hot! The wisdom of the ages has never been able to definitely establish this fact before, but now this young genius disposes of it with a word. Will you kindly dispell my ignorance and tell me how hot?"

"That depends on the depth to which you penetrate," I answered. "The temperature increases as you go deeper."

"Splendid!" he cried, rubbing his hands. "That explains, no doubt, the reason why the water from artesian wells which are usually quite deep is always at so high a temperature, and also why geysers, which usually come from sources comparatively near the surface, are invariably icy. It proves the fallacy of going into a cavern or down into a mine on a hot day for the purpose of keeping cool. I have only one question to ask you and doubtless you have an answer on the tip of your tongue for that too. Why is it that many of the deepest borings into the earth's skin fail to show as high a temperature at the bottom as obtains on the earth's surface?

"They probably happen to be at points where the crust of the earth is unusually thick," I answered, ignoring the rest of his remark.

"How interesting!" he cooed. "I presume, then, that the interior of the globe is a fiery mass of molten rock which is continually trying to break out into the outer air

CAPT. S. P. MEEK, U. S. A.

THE present author needs no introduction to science fiction, and he may always be counted to present an unusual angle of any theme that he approaches.

In his present offering he has tackled a question which, despite its importance, is only imperfectly understood by our best scientists.

What makes earthquakes? What causes volcanoes? Of what is the center of the earth composed? What is the general constitution of the inner part of the earth's crust? Is the inside of the earth hot or cold? These questions are all ones to which science today has not given us a satisfactory [illegible]

Many scientists have attempted to solve the problem, from an original standpoint. So has Captain Meek. He has put into his story a tremendous amount of original thinking, and has arrived at a conclusion almost directly opposite to that generally accepted today.

Incidentally, the author has given us a most exciting adventure, which will be long remembered in the annals of science fiction.

as it is subjected to absolutely incredible pressure by the cooling of the earth's skin?"

"Of course," I replied, "the existence of earthquakes and volcanoes is enough to establish that without question."

"Surely," he replied, "beyond question. You have doubtless seen samples of this molten rock?"

"Yes indeed," I said. "I happened to be present the last time that Kilauea turned loose and I saw the pit of Halemaumau filled with it."

"Did you take samples of it?" he asked.

"I did."

"And was the molten rock of the limestone type or of the granite type?"

"Neither. It was *Aa* lava."

"Which happens to have none of the characteristics of either of the two common rock structures of the surface, the stratified and the igneous," he replied, "and which is a substance found nowhere on earth except in discharges from volcanoes. Did it never strike you as strange that lava has never been found except in the immediate vicinity of volcanoes, either active or extinct? If the whole earth was at one time composed of the molten rock, this lava which flows from volcanoes, why was none of it left behind when the mass cooled enough to form a crust?"

"Because it has a different specific gravity from the rocks which compose the crust," I replied.

"I am well aware of that; lava is much lighter than granite. For that reason it seems strange to me that the granite should have floated and so solidified first, leaving the lighter lava to sink to the bottom and so remain in the center. Of course, you can explain that fact?"

Not Hot But Cold

I HAD kept my temper so far, but my gorge rose at sarcasm and his arrogance; and I flared out.

"I have told you what I know!" I said shortly. "I didn't come here to be subjected to an examination on my scientific attainments or to be called an ass for believing what is common knowledge among educated men. The apparent contradictions which you have pointed out can be readily explained by men who have devoted more study to the subject than I have."

Instead of flying into a rage as I fully expected him to do, the Professor threw himself back into his chair and chuckled.

"You are partially right," he said. "Those contradictions can be explained by *a man*, not *men*. Only one man in the world has ever devoted the attention of a first quality brain to the problem. *I* can explain them."

"All right, go ahead and explain," I replied, still nettled by his manner but also amused by his calm assumption of superiority.

"Gladly," he answered. "Those discrepancies, and many more which I have not mentioned, can all be explained by three facts. The first is that the interior of the earth is not hot but instead is cold. The second is that it is composed, not of molten rock, but of water-soluble salts. The third is that the surface of the earth is not contracting. Instead, the center is expanding."

"Nonsense!" I exclaimed.

Instead of causing an outburst from the Professor, my remark seemed to amuse him.

"And why nonsense?" he asked. "Can you cite one specific fact or one tenable theory to disprove my statements, or can you name one bit of recorded data that cannot be logically explained by it?"

"Certainly!" I blurted out. "The common belief of civilized mankind alone——"

"The common belief of fiddlesticks!" he snorted. "The average man takes his science from the same source from which he takes his theology. Because a dyspeptic monk of the middle ages pictured as hot a place of torment for damned souls and located it underground—an idea which he stole from Greek mythology—the Christian world has blindly accepted those teachings ever since and has twisted every observed fact to support that theory. Name one single specific fact which will support the theory of internal heat."

"Well——volcanoes, for one thing. They certainly point to severe internal heat."

"Granted. Volcanoes do indeed point to internal heat, *near the surface*. Has it ever occurred to you that heat might very easily be generated by purely local mechanical or chemical reactions without relation to a reservoir of central internal heat?"

"I had never thought of that," I admitted.

"I daresay. Explain then, if you can, the intermittent action of volcanoes. If they are eruptions from an internal reservoir of molten rock, why do they erupt occasionally with great violence and then lie quiescent, often for centuries? If they are caused by a gradual and continual shrinking of the earth's surface, why is not the rate of flow slow but constant, once the retaining outer skin has been punctured?"

I decided to try another tack.

"How about earthquakes?" I asked. "They are surely evidence that the crust is shrinking and how could it shrink, except by cooling?"

"How could cooling of the surface produce an earthquake?" he demanded. "Have you ever seen a sphere of hot material cool?"

"Yes."

"Did the outer skin quiver and open cracks in it?"

"I have seen that happen."

"Under what conditions?"

"When the material was suddenly quenched."

"Agreed, but in what medium was the earth quenched when it was molten?"

"In air."

"The thin air film surrounding the earth could have no quenching effect on such a mass. The very idea is absurd. Now let me ask you another question. Have you ever seen a sphere of material swell from internal pressure?"

I thought for a moment.

"Yes," I replied. "I have seen a lead sphere swell and burst under internal hydraulic pressure."

"And was not the bursting marked by the trembling and giving of the outer skin with consequent opening of cracks before the sphere gave way? In other words, by phenomena resembling those of an earthquake on a miniature scale?"

I was forced to admit that such was the fact.

"Then what further proof do you wish me to adduce to prove that the outer skin of the earth is not shrinking but instead that the center is swelling?"

"I confess that I don't understand, Professor," I said. "I admit that your reasoning sounds logical, but of what is the center composed and why should it swell?"

"I am much relieved to have your approval," he said with a return to the sarcastic manner he had momentarily lost. "It is barely possible that an idea can find lodging in your skull cavity. If it can, it should grow well in the mud which fills the place intended by an oversanguine nature for brains."

I sprang to my feet.

"I did not come here to be bullied and insulted," I said hotly. "I came here to ask a favor in a gentlemanly man-

ner and I expected to receive a civil answer, even if an unfavorable one."

My sudden flareup seemed to amuse the Professor, for he threw himself back in his chair and laughed.

"Sit down," he said, "I have a piece of advice for you."

A Critical Stage

SOMEWHAT sheepishly, I resumed my seat. After all, he was Alice's father and I knew that I would have to humor him if I desired a favorable answer to my suit.

"What is the advice?" I asked.

"Keep your temper," he replied.

I nearly lost it at that remark but I managed to restrain myself.

"I will answer your questions," he said when I settled back into my seat. "First, as to the composition of the center of the earth. I don't know and neither I nor any one else will ever know until borings are made and samples taken. I am confident, however, that when this is done, that it will be found to be composed of water-soluble salts."

"What proof can you bring forward of that?"

"None whatever. I have no more proof for my theory than the solemn asses have for theirs when they tell us that the interior of the earth is a seething mass of molten material. Until the center is reached and explored, your question cannot be definitely answered."

"Why do you think that it is composed of water-soluble salts?"

"Because that is the only theory which the mind of mankind has ever propounded that begins to explain in any logical way the observed phenomena. In the absence of accurate scientific data, we must proceed by a process of philosophical reasoning from the point where our data leaves off. No new discovery has ever been made in the world except by some one reasoning beyond the point of which we have scientific proof and building up a theory which satisfactorily explained the known facts and then seeking additional data to substantiate his theory. Often the additional data which he obtains serves to modify, or in an extreme case, to even disprove his theory. Often the additional data which he obtains accommodate the facts and proof sought to support it. That is the course of scientific research.

"To answer the second question. The reason why the core of the earth is swelling is that the salts which compose it are gradually going into solution. With the constant influx of water into the mass, a process which has gone on since the world existed, the mass is liquefying and growing larger. I have data at hand which tends to make me believe that this process is now approaching a critical stage. The skin holding the mass of water-impregnated salt is stretching toward its bursting point. Had the skin not been supported by the rock surface of the earth, it would have given away long ago. When it does give way, it will probably blow the earth into fragments."

"Why so?"

"For the same reason that a charge of smokeless powder will blow a mass of rock into fragments. Confine a charge of powder in a plastic mass of putty and ignite it and it will open the ball without disintegrating it. Confine the same charge in a solid rock container so that a high pressure is generated before the container gives way and the result is an explosion which shatters the rock into bits."

"But why should it explode even so? Water-soluble salts are not as a rule highly explosive. Even if they were, if your theory of the coolness of the interior is a fact, how did they become ignited?"

"I did not say that the interior was *cool*, I said that it was *cold*. It is bitterly cold, so cold that the water near it is frozen and only by very gradual melting is a small portion allowed to enter the mass. Were the interior warm enough to permit a rapid diffusion of the available water through the mass, the world would not last an hour."

"I still do not understand what the force is which threatens to disrupt the planet."

"It is osmotic pressure."

"And what is that?"

"Is it possible?" cried the Professor, in what I think was genuine surprise. "Is it possible that a man can go through one of the institutions which we call a university today and rise to some eminence in a profession and be so densely ignorant of the simplest physical laws? It is inconceivable. Sit down," he went on as I started to rise, "I had no intention of insulting you. I will try to explain in words so simple that even the limited mentality of a publicity agent, as I believe you call yourself, can grasp it."

"Do you know what is meant by a semi-permeable membrane?" he asked.

"I do not," I replied.

"A semi-permeable membrane is a skin of substance through which the solvent of a solution can pass, but through which the solute or dissolved substance either cannot pass or can pass with great difficulty. Assume for example, that we have a bag composed of such a membrane which is permeable to water but not to salt. If we fill this bag with a solution of salt in water, in the course of time, the water will pass through the membrane and evaporate, leaving the salt behind in a dry condition. If the bag of dry salt be then immersed in pure water, the water will pass through the membrane and restore the original condition of a salt solution in the bag. The solute will then begin to exert what is called osmotic pressure on the membrane and if the membrane be not sufficiently elastic or sufficiently strong to resist this pressure, it will burst."

"Do such membranes really exist? I have always thought that when a substance was dissolved, it would pass through anything that would allow the pure solvent to pass."

"Certainly such membranes exist. The phenomenon of osmosis, as it is called, was first studied in 1877 by Pfeffer, a botanist, who used certain plant cells for the purpose. The cell content included a liquid containing various salts in solution and a protoplasmic layer which was not attached to the cell wall. This protoplasmic layer acted as a semi-permeable membrane. When such cells were immersed in a *concentrated* solution of salt, the water passed from the interior of the cell *to the solution* and a shrinking of the protoplasmic layer from the wall of the cell could be observed with a microscope. On the other hand, when such cells are immersed in pure water or a very dilute solution, the water passed *into the interior of the cell* and distended the protoplasmic layer until it filled every corner of the cell.

CHAPTER II

A Tremendous Force

"A MORE common example and one with which you are more familiar is the process of drying fruits and vegetables and of utilizing the dried product for the table. A grape, for example, consists of a skin which is permeable to water, filled with

a solution of various salts, sugars and other substances. The skin is permeable to the dissolved substances only to a very slight degree. If we treat the grape in the proper manner, the water will pass through the skin and be lost by evaporation and the result is what we call a raisin. When we immerse a raisin in water, what happens? The water passes through the skin into the interior and the raisin swells and resumes its original characteristics to a certain extent. Do you follow me?"

"Yes, but it seems to me that there is a flaw in your argument. No one would ever mistake a cooked raisin for a fresh grape. It never swells to the same extent."

"No, for the dual reason that the skin is not a perfect semi-permeable membrane and that certain chemical changes occur which prevent the raisin from ever resuming exactly the characteristics of a fresh fruit. The same principles apply to all drying of fruits and vegetables. Let me describe for you a *perfect* semi-permeable membrane.

"Let us shake a concentrated solution of calcium nitrate with a small amount of pure phenol, or carbolic acid, so as to saturate the nitrate solution with the phenol. This mixture we will pour into a tall narrow cylinder, like a glass graduate. The excess phenol will rise and float on the surface of the nitrate solution and can be readily distinguished from it by the brownish orange color of the phenol. Only enough phenol should be used to make a layer a quarter of an inch or less in thickness. Now let us introduce distilled water, also saturated with phenol, cautiously into the cylinder by pouring it down a stirring rod held against the side of the graduate. Due to the differences in specific gravity, the water solution of phenol will float on top, giving three distinct layers.

"The water on both sides of the phenol layer is soluble in phenol and so, by dissolving in the phenol from one side and passing out the other, can traverse the layer. The calcium nitrate, however, cannot traverse the phenol in which it is not soluble. Here we have a perfect semi-permeable membrane. If we mark the position of the phenol layer and set the apparatus aside, it will be found that the water gradually passes through the phenol layer, diluting the calcium nitrate solution and the phenol layer will gradually rise until in time it surmounts all the rest of the liquid. In other words, the osmotic pressure of the dissolved calcium nitrate has pushed the phenol layer up to the top of the cylinder. This proves the existence of a real force which is pressing against the membrane."

"Such a force must be very slight," I remarked.

"On the contrary, the force is tremendous. It can be readily measured. If we take a porous cup and prepare it properly, we can use it to obtain actual measurements of the osmotic pressures of dissolved substances. When we do, we find that the pressure is directly proportional to the concentration of the solution and inversely proportional to the *absolute* temperature."

"How do you prepare such a cup?"

"A deposit of gelatinous cupric ferrocyanide is deposited in the pores of the cup, from which the air has been removed by means of an air pump. The interior of the cup is filled with a solution of potassium ferrocyanide and the cup is immersed in a solution of blue vitrol or copper sulphate. When the two liquids meet by diffusion within the walls, a dense precipitate of cupric ferrocyanide is formed. This constitutes a semi-permeable membrane which has a maximum permeability to water and a minimum permeability to dissolved substances and which, due to the retaining porcelain, has the strength necessary to allow the pressures to be actually measured.*

"Once the cup has been prepared, the solution whose osmotic pressure it is desired to measure is placed in the cup and the cup sealed and immersed in water which is kept at a constant temperature. Leading from the cup is a bent tube leading into a glass cylinder which is used as a manometer. The upper end of the tube is closed and some air is confined in this end by mercury. As the osmotic pressure is exerted, the volume of the air is diminished and by reading the diminution in volume, the pressure can be readily determined."

"Are these pressures large?" I asked.

"As I said, they are tremendous. In 1905, Morse and Frazer made some measurements on the osmotic pressures of cane sugar. In a solution containing one mole or 342.18 grams of sugar in 1000 grams of water, the recorded pressure was 24.46 atmospheres, or about 350 pounds per square inch.** While the total internal pressure on a one inch sphere would be only about eleven hundred pounds, in the case of a sphere with a diameter of one thousand inches, about eighty-three feet, it would be about one billion, one hundred million pounds, and in the case of a sphere with a diameter of some seven thousand, eight hundred miles, as is the case with the earth, the total pressure would rise to a figure of two hundred and fifty-five quintillion pounds, which can be represented as follows: 255,000,000,000,000,000,000 pounds."

A Dire Prediction

"SUCH figures as those seem to me to prove the falsity of your hypothesis," I exclaimed. "It is inconceivable that any membrane such as you suggest could withstand for a moment such a pressure as you have named."

"No such pressure exists," he replied. "The figures which I gave were for a strong solution of cane sugar. If we use common salt as the basis for our calculations, we get smaller figures, due to the smaller solubility of salt in water, but still large enough to disrupt any membrane that the mind of man can picture. The reason why no pressure has yet developed large enough to disrupt the planet can be explained by the fact that the membrane is conceivably quite thick and probably resistant to permeation by water. When we add to this the fact that the water must seep through perhaps fifty to one hundred miles of rock before it can reach the membrane, it will be seen that the amount of water available for solution at any one time must be very small.

"In addition to that deterrent effect, we must remember that solution is an endothermic reaction; that is, in dissolving, the solution absorbs heat and the water becomes *colder* during the process. On such a scale and insulated as the core of the earth is, this reaction would abstract all of the available heat and water approaching the membrane would be frozen, which would add to the slowness and difficulty of permeating the membrane.

"Let us revert for a moment to the obsolete theory which you first confronted me—the fact is that the gradual cooling of the surface of the earth observed during

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** Author's Note—A somewhat better cup can be made more rapidly by depositing the cupric ferrocyanide electrolytically, using tenth normal solutions of potassium ferrocyanide in the cup and copper sulphate outside the cup. The air is first removed from the pores by electrical endosmosis and then the precipitate deposited by using the anode inside the cup and the cathode outside, using an electromotive force of 110 volts. A membrane will be formed in two hours as against several days by the diffusion method.*

***(Amer. Chem. Jour., July, 1905.)*

the ages has been distorted to prove that the center mass is cooling off. They forget that the only means of cooling would be through the conduction of the heat through the crust and its radiation from the surface so that any acceleration of the cooling would be reflected in hotter temperatures near the surface rather than cooler. The actual facts in the case, I feel certain, are these: the core of the earth is gradually absorbing heat so that instead of heat going from the center to the surface and being radiated off, it is going from the surface to the center and being lost in the endothermal reaction of solution. This accounts logically for the observed phenomena without the necessity of distorting the facts to fit a moth-eaten theory. Have you any questions?"

"The theory seems to explain the facts," I admitted. "You said earlier that you had data which led you to believe that this membrane was strained almost to the breaking point. Would you mind telling me what the facts are that lead you to this conclusion?"

"It is the great increase in the number of earth tremors which have been recorded within the last decade," he said. "The amount of seismic activity is increasing in almost a geometrical progression."

"There hasn't been a bad earthquake in the last ten years," I objected.

"Naturally a man in your profession would say that," he replied with a snort. "You measure the intensity of a seismic disturbance by the number of lives lost and the number of dollars worth of property destroyed. I grant that there has been no earthquake lately which has resulted in a heavy loss of life. But where, only a generation ago, seismic disturbances were recorded only occasionally, today they are almost continuous. Most of them are slight but that, I believe, is because the membrane and its supporting rock wall have been stretched almost to their elastic limit and they can give no more. The slight tremors we are recording now on our instruments are the efforts of the membrane and the walls to give further, efforts which are defeated by the rigidity of the rock. Thus a pressure is building up which will gradually increase until the limit of endurance of the rock skin has been reached and then will come an explosion which will shatter the globe into fragments."

His reasoning sounded logical and his immense earnestness impressed me in spite of myself. I was, and am, no scientist, but Professor Hurlburt's name was one to conjure with in the scientific world although his reputation had suffered somewhat lately because of radical theories he had proposed to various scientific bodies.

"If you feel that such a calamity is pending," I ventured, "why not take some steps to prevent it. Is there no way to stop it?"

"There is," he replied, "and I should think that even your limited scientific intelligence would at once see it. If you have a sphere with an internal pressure which is sufficient to threaten its integrity, how would you proceed to relieve this pressure?"

"By removing some of the contents," I suggested.

"Exactly. If this skin, this semi-permeable layer which must exist as a continuous film around the entire interior of the earth were to be punctured so that the pressure could force the solution out through the hole thus formed, the danger would be over."

"Why not place your proposition before the governments of the world and have such a hole made?" I asked.

He snorted in disgust.

"I have placed my theory and my data before every scientific body of any repute or prominence in the world," he answered, "and I have been laughed at for my pains. Not one of them would condescend to even appoint a committee to examine into it. The blind fools, because my theory runs counter to their usual line of thought, are unwilling to consider it. For a time I considered letting them reap the reward of their folly, but I realized that the catastrophe which I am sure is on its way, will react not only on the learned fools who compose these bodies, but also on the great mass of humanity who have had no opportunity to pass judgment. Consequently, I have decided to ignore the slights which have been put upon my mentality and appeal direct to the general public for the funds needed to make my bore. Directing such campaigns is your business and that is why I sent for you."

I had become engrossed in the immensity of the idea that I had for a moment forgotten that he had not sent for me but that I had come to see him on a very different errand. His next words recalled this fact to me.

"You said when you came in, Lawrence, that you had a favor to ask of me. I will be very glad, as a preliminary to further arrangements, to grant it if it is within my power. Kindly name it."

There was no time for finesse. With his keen grey eyes boring into me there was only one thing to do, to blurt out my request baldly.

"I want your permission to marry Alice," I said.

I had expected an outburst but I was agreeably disappointed. He sat musing for a moment and then replied.

"I can see no great objection to it," he said. "To be sure, your mentality is far below hers, but on the other hand, that may be an advantage. You will hardly be in a position to argue with her and so there should be little friction between you. You must remember, however, that she is not yet of age and that my consent is necessary."

"I realize that, sir," I replied.

"You have done well in your chosen field of endeavor," he went on, "and your request comes at a time when I need the wholehearted aid of a man skilled in publicity to help me. If you will sever your present connections and put your time and talents at my disposal for the campaign I have mentioned, I will consent to your marriage with Alice as soon as success crowns your efforts. In the mean time, I will extract from you a promise that you will not be rash enough to elope with her to another state where the marriage laws are more lenient. If you can make a success of this campaign, Alice shall be your reward. If you fail, I cannot consent to her marriage with a man who is a failure in his chosen line of work. Do you agree to those terms?"

I was on my feet in an instant.

"I agree, Professor," I cried, "I agree gladly. I would do anything to win Alice and even without that incentive, I would help you. Your idea is the greatest for a campaign that I have ever encountered and it will make me as nothing else would. I am with you, heart and soul."

"Splendid!" he cried as he grasped my outstretched hand. "Stay to dinner and we'll go over our preliminary plans tonight."

CHAPTER III

Preliminary Plans

I BELIEVE that all of my readers are familiar with the advertising campaign I launched in the fall of 1935. It was a success from the start. I waited until a dull period came in the world's news and then broke forth with full page advertisements in the leading New York papers. The sheer audacity of the thing claimed immediate public attention and the prominence of Pro-

fessor Hurlburt's name made the thing *News*, with a capital N.

The Professor had a few thousand dollars with which we financed the preliminary advertisements and they quickly produced enough contributions to enable me to extend the scope of my advertising. Fortunately our whole idea was ridiculed and bitterly attacked by all of the learned societies, thus arousing sympathy for us in the midst of the laity and getting us a lot of free advertising in the news columns. In fact, for some time we almost monopolized the front pages of the world's press and I was soon able to assign my paid advertising on a "page for page" basis; that is, I would put in one page of paid advertising for every page of writeup which we got in the news section.

Practically every scientist of repute ridiculed and attacked us as an individual as well as doing so as a member of a society. We welcomed this opposition and I made the name and fortune of more than one obscure man who endorsed us. The mere fact of an endorsement was to the public, a sure evidence of courage and vision on the part of the endorser. The whole thing was such a sporting proposition that nearly everyone was willing to "bet a dollar" on us and the flood of small contributions nearly swamped the large clerical force I had engaged.

When contributions began to lag, I announced that we would issue a "share" in the enterprise to everyone contributing one hundred dollars or more. As I pointed out, if Professor Hurlburt was right, the owner of such a share would win eternal distinction as one of the far-seeing persons who had saved the world from destruction, while if his opponents were right in their theory of intense internal heat, we would tap at less than the fifty miles we expected to go down, an inexhaustible source of energy and power which would make the holders of our "stock" rich. Once they were convinced that we really meant to dig, several newspapers paid large amounts for the rights to the news stories. So well did I argue that many of our bitterest opponents became very heavy contributors. So confident were they of the truth of their belief that they felt certain that their "investment" would yield them very handsome returns on their money.

The depth to which we proposed to drill aroused another fierce controversy from those denying our ability to go beyond a few miles. This threw a momentary damper on the enthusiasm, but I revived it by announcing that we had engaged no less a person than John Callahan to superintend our drilling at a retainer fee of one hundred thousand dollars. The fee included the sole rights, for a period of five years, to the newly invented Callahan rock drill which on test had drilled a twelve inch hole into granite at the rate of sixty feet an hour. (I might mention in passing that John Callahan received his fee in the form of ten thousand dollars cash and ninety thousand dollars in advertising).

The final push which sent us over the top was the approval of the British government. The unemployment in the mines of Wales was unusually acute that year and the Labour Government in office in 1935 saw a chance to have some of their idle men put to work. They endorsed our plan, agreed to aid us in the political and diplomatic phases of our work, granted us an outright subsidy of two million pounds and an additional subsidy of two shillings a day for every British miner whom we employed.

While I was engaged in handling the publicity and financial end of the enterprise, Callahan and the Professor were engaged in making surveys to decide on the site of our operations. I had thought that the character of the rock through which we would have to drill would be the deciding factor, but to my surprise, neither the Professor nor Callahan were inclined to take that into consideration.

"The Callahan drill will go through any kind of rock and enough high explosive will pulverize anything," Callahan announced, "but I don't know how deep I can go and keep on going. The air pressure at the lower levels will be something to contend with, even if internal heat doesn't develop. Also we must figure on ventilation. No indeed, don't pay any attention to whether we have to go through limestone or gneiss, pick out the place where the skin you want to pierce is thinnest."

"I agree with you," replied the Professor. "After all, we cannot tell anything by the rock which we find a few hundreds of yards from the surface. No bore has ever been made to anywhere near the depth that we intend to go and no one can tell what the character of the rock will be that we will strike ten or even five miles below the surface. I have a strong idea that once we get below the outer skin that we would find the rock everywhere pretty much the same. The thing to do is to study the seismic charts of the earth and pick out the place where the drilling will be at a minimum depth."

"That would be likely to be in the vicinity of an active volcano, would it not?" I asked.

"Certainly not!" replied the Professor with asperity. "Where the skin is thin, the heat would naturally be abstracted from the surface more quickly and no volcano would be probable. Anyway, the task of drilling through molten lava would be a little greater than even Mr. Callahan would like to undertake. I want to study the matter a little more before I make a decision, but I have an idea that the site will be somewhere in Asia."

Danger Ahead

THE spot which the Professor finally chose was on the edge of the Gobi desert, not far from the hamlet of Ulan, just over the edge of the Great Khingan Mountains from Peiping. He thought that a somewhat shallower drill could be made if we penetrated inland over the Gobi some three hundred miles near Chederkoo, but Callahan demurred. The problem of transport over the inadequate railroad west from Tientsin, our port, was bad enough without adding the burden of three hundred miles of truck transport over the roadless Gobi.

The disturbed political conditions of China caused us some worry, but the Nationalist party was pretty well on the rocks at the time and British influence was paramount with Quan, the Peiping Tuchun, and the British government was sympathetic. The difficulties which confronted us were smoothed away as if by magic by the British Ambassador and our men were soon at work laying track from the existing railroad to the site of our work. Callahan went ahead with a force of construction men to build the road and erect our camp while the Professor and I stayed behind. I was to wind up the financial matters and the Professor to attend to the ordering and shipping of the machines and other supplies which Callahan cabled for from time to time.

Our work was finished at last, or at any rate the major portion of it was finished and I turned the tag end of my job over to an assistant and the Professor turned the purchasing activities over to an agent. The two of us with Alice took ship at San Francisco for China and the

great adventure. The long nights on the boat were a period of sheer delight to Alice and me. I could write pages about the trip but alas, I fear that it would interest no one except the two of us and I will hasten on to the time of our arrival at Peiping.

John Callahan had met us at Tientsin and had travelled with us to the capital where we were met by the British Ambassador. He looked grave when he saw Alice, but he said nothing until after dinner.

"Surely, Professor Hurlburt," he said as we sat on the verandah smoking, "you are not planning to take your daughter into the interior?"

"Why not?" asked the Professor in surprise.

"Because of the state of the country. It would be most decidedly a dangerous proceeding."

"Why, I thought that Marshal Quan had promised us his protection."

"He did, but his authority doesn't run fifty miles outside Peiping except where he has loyal troops stationed. He will see that your supplies are shipped through Peiping and as far as his troops are stationed without more than a moderate 'squeeze', but beyond that point, arrangements will have to be made with the local leaders. Even in the days of the empire, the authority of the Son of Heaven was a rather shadowy thing on the other side of the Great Khingans. The only law that was obtained there for centuries is the law of might."

"I am very much surprised," exclaimed the Professor. "I judged from the press that the section was perfectly safe else I would have left Alice in the United States. As it is, I shall send her home at once."

Callahan and I agreed with the Professor—at that time. Alive said nothing to her father but she cornered me the next day.

"Lawrence," she said abruptly, "you want to marry me, don't you?"

"Of course," I replied in bewilderment.

"Then you had better do it while you have a chance. I am ready to marry you tomorrow, *but*—if you send me back to the United States alone and go on to the camp, you will have to find another girl. You may stay there for years and I don't intend to stay home and wait for you."

I think that I said once that Alice was inclined to obstinacy. If I didn't, I will hasten to rectify the omission. I argued for three hours, but in the end, we were back to where we started. Either I married her the next day and took her to the camp or the deal was off. There could be only one answer on my part.

"A promise is a promise, Lawrence," said the Professor when I broached the subject to him. "You have done your part and I will give you my consent, but I won't consent to her going to the camp. I had hoped that you would come for you have earned the right to be present, but you come alone or you stay behind."

We were married that day.

Alice could be stubborn, but she could also coax very prettily. John Callahan held out against her for two days before he capitulated, horse, foot, and guns and began to urge on the Professor the advisability of allowing her to go along. The Professor was adamant but three days later the Ambassador did an about face and could see no reason why she should not be allowed to go. I suspected that the little minx had been talking to him, a suspicion which I later verified.

"But if it wasn't safe a week ago, I fail to see why it is safe now," protested the Professor.

"I expect that I may have exaggerated a little," admitted the Ambassador. "At any rate, there is one aspect that I overlooked. As I said, the rule in that region is one of might. I understand from Mr. Callahan that you will have about a thousand white men with you and that you will have them armed and will have machine guns and artillery. In such a case, you will be safe from any force which the tribes could muster against you. And the fact that Marshal Quan is on your side will prevent an attack by regular troops who are the only ones who have artillery. Under the circumstances, I feel that it is really safe enough. Mr. Callahan tells me that many of his men are married and that he had planned to allow them to bring their families to camp. This will give her plenty of company and it will doubtless be without danger. The only thing to watch is that no one wanders far from the camp without adequate guard until arrangements have been made with the local leaders of the tribes."

Ready to Dig

THE Professor was still doubtful about Alice's pleading and the fact that I had an undeniable right to be present carried the day and it was decided that Alice should go. We had quite a train-load of assorted supplies to take up with us and it seemed that we would never get started, but eventually we overcame the dilatoriness of the coolies and satisfied the rapacity of the officials and our special train was ready to move. It is a splendid commentary on the railroads of China that it took us three days to cover three hundred miles of Chinese roadbed. The last seventy miles, which was over tracks which we had constructed, we did in three hours.

The train finally drew up at Camp Hurlburt, as Callahan told us he had named it and we detrained. Callahan had done wonders in the few months he had been over there. Where there had been nothing but the sand and rock wastes of the desert with the mighty Khingans rising in solemn grandeur in the background, now there nestled a snug little village of wooden houses with bright flowers blooming beside many of them.

"These are the miner's homes," he explained. "My original plan, which since your agreement, we will adhere to, was to allot one of these houses to a family or to three bachelors. Ahead you can see the fortified compound in which are the administration buildings, the magazines, storehouses, your quarters and the machinery. Inside the compound is also where we will drill."

The road was barred by a huge stone wall castellated on the top. From embrasures the muzzles of field pieces protruded while the eye was caught by the sparkle of the bright work of machine guns. We drove through a gate and found ourselves confronted by a massive stone building.

"That is the headquarters building," explained Callahan. "Your living quarters are behind it. The other buildings are the power plant, the storehouses and magazines. The large building over there which is not quite finished is the emergency dormitory."

"You look like you were ready for a siege," I remarked.

"We are," he said grimly. "So far we have had no trouble and I have been able to square most of the local leaders, but I am taking no chances. Our men are well-drilled and are divided into gun crews and I think, with our fortifications, that we could stand off ten thousand tribesmen easily, provided they have no

heavy artillery."

Professor Hurlburt looked at Alice rather anxiously, but said nothing.

"This is the site of the big hole," went on Callahan as we passed behind the headquarters building. He pointed out an area that was marked off by small white flags.

"It looks smaller than I expected," I remarked.

"It is a good deal larger than it will be when we get through the top soil," he replied. "Once we scoop away the loose stuff I do not intend to slope the hole at all but to go straight down. The hole will be a hundred yards square to start. I can't go over a thousand feet economically on one lift. The way I will manage it is this. We will start with a hole one hundred yards square and go down a thousand feet. There we will establish a relay lifting station with power, ventilation, lifts, a shift station for our bucket conveyers and so forth on an area eighty yards long by fifty yards wide in the northeast corner. The rest of the hole will be sunk another thousand feet. Then another relay station will be set up similar to the first except that it will be in the southeast corner. The third relay station will be in the northeast corner under the first one, the fourth in the southeast corner under the second and so on down. As a result, we will have a hole one hundred yards long by fifty yards wide sunk straight down into the earth while another space of equal size will be partially dug and occupied by our relay stations."

"Very ingenious," commented the Professor. "I knew that you would have to establish such stations but I had a vision of starting a hole half a mile or more square and staggering it down like a flight of steps."

"It would have to be a good deal more than half a mile square to go down fifty miles with a step formation," laughed Callahan. "No, Professor, by the method I have outlined we will reduce the amount of digging. Now I will take you to your quarters."

"When will actual work start?" inquired the Professor.

"At any time that you wish. Some of the men will have to be used for construction work for a few months yet, but most of them are available now for actual digging. I could have started the excavating a month ago, but I delayed it in order to let you throw out the first shovelful."

Professor Hurlburt smiled like a pleased schoolboy.

"It was very thoughtful of you, John," he exclaimed. "If you will have everything in readiness, we will start in the morning."

CHAPTER IV

To Work!

WHEN work was actually started the next morning there was a spectacle which I will never forget. Our white miners stood bareheaded in serried ranks while the professor, incongruous in his palm beach suit and panama hat, strode to the edge of the space marked off for excavation. Several hundred of the wild nomads of the desert, attracted by the report that the white men were about to start work, sat around on their shaggy little ponies behind the miners ready for instant flight should danger threaten. A dozen huge steam shovels stood ready for work as soon as the Professor should start operations while on the wall above us a gun crew stood ready to fire a salute as the first shovel was filled. Before the Professor stood the microphone of our broadcasting station ready to carry to our supporters all over the world the news that the stupendous task had been actually begun.

Professor Hurlburt grasped the shovel and bent forward. He paused as it touched the ground and straightened up and spoke.

"We are about to start work on the greatest and most important piece of engineering work which has been attempted since the dawn of man," he said solemnly. "Before we do so, it is just and fitting that we pause to invoke the blessing of that One who rules and presides over our manifold labors."

He paused and let his eye rove over the ranks of men.

"Gentlemen," he said simply, "Let us pray."

He dropped to his knees and simply and in a few words asked the blessing of Deity on our labors. I never knew that Professor Hurlburt was a religious man, but no prayer that I have ever heard had half the dignity and impressiveness of the few simple words spoken by that man who had risked his reputation and had sunk the scanty savings of a lifetime of scientific research in an attempt to save the world from a peril which he felt was threatening. He finished his prayer and rose.

"And now," he cried in ringing tones, "to work!"

His shovel dug into the sand and a shovelful went whirling away. The gun on the wall roared a salute and the huge steam shovels clanked and started moving the sands of the Gobi away to uncover the bedrock through which we were to drill for such a distance.

John Callahan knew his business and the shaft went down with what seemed to me almost miraculous speed. A few days disposed of the loose material and the exact size of the bore was laid out and our miners started their work. With Callahan drills they sunk their holes, tamped home their charges and then mounted to the surface while tons of TNT shattered the rock and cleared the way for the giant steam shovels which tossed the loosened rock onto endless belt bucket conveyers which carried it to the surface. Callahan had chosen the highest point in the neighborhood for his work. I had been surprised when I had first noticed this, but when we started to take out thousands of cubic yards of rock, the reason became evident. The conveyers dumped their loads into carts which ran by gravity down a track to a point nearly five miles from the camp. There they were dumped and switched onto the return track where small electric engines towed them back to the edge of the shaft for another load.

When the shaft was down the first thousand feet there was a pause for a few days while the engineers lowered the relay machinery into the hole and set it up. Soon their task was done and the blasts again shattered the stillness of the desert and the shaft went deeper and deeper into the interior of the earth.

There were a few delays, as for example when our pipe line which supplied the crude petroleum on which we depended for our power burst and again when a conveyer on the tenth level broke and it was found necessary to lower huge hoists over two miles into the earth to lift it out and repair it, but on the whole our progress was steady. Working two shifts a day, for sixteen hours out of the twenty-four the hole went deeper and deeper.

After the first few levels had been penetrated, it became impossible to use TNT or any other common explosive. The task of driving out the nitric oxide fumes was too great to permit the use of any nitrogen-carrying explosive. Its use also made it imperative that all men be removed from the shaft clear to the surface of the ground before a shot was fired. When they had to rise several miles, fire their charges, wait for the ventilators to clear the shaft and then descend again, most of the working time became a dead loss. I wondered what Callahan would do, but this to him was only one of the minor problems with which he was confronted.

"It is quite simple," he told me when I asked him how he would go about it. "TNT is cheap and powerful and so is nitroglycerine. Both of them are excellent explosives for ground or shallow shaft work, but I have another which is more powerful and which leave no fumes to contend with. It is blue gas."

I expressed my ignorance and he went on.

"Blue gas is a mixture of two parts of hydrogen to one part of oxygen, by volume. Such a mixture explodes with great violence and gives as its sole product of combustion, H_2O, which is, of course, water. It is impossible to get enough of it in a gaseous state into a hole to do a great deal of damage to rock, but we are going to liquefy it. These cylinders are arranged for using it. The larger one will be filled with liquid hydrogen and the smaller one with liquid oxygen. The two fluids are held apart while they are being lowered into the hole, but by sending an electric current through this fusible plug, it is melted and the two substances allowed to intermingle. An electric spark will then ignite them and the resulting explosion will be more powerful than the charge of TNT which we have been using. The men will only have to go up to the relay station above them, fire the charges and then at once return to work."

The Time Draws Near

DEEPER and deeper went the shaft. By the time we had penetrated ten miles, the scientists who had derided Professor Hurlburt were silenced, for *the temperature at the bottom of the shaft was sixteen degrees lower than at the surface.* This temperature steadily decreased as we went deeper and the physiographers of the world began to doubt their worn-out theories. Many of them made the arduous trip to the scene of our work to measure the temperatures for themselves. Some came to scoff but they left convinced and most of them began to accept without reservation the very theory they had first derided. It was fortunate that they did so. We had collected about sixty million dollars before we had started work, but it was amazing to see how fast it was spent. But, after the first ten miles, there was no question of funds. With the shattering of their old theories of the composition of the world, humanity knew not what to believe and they turned to Hurlburt as their new scientific Messiah. The governments placed unlimited credits at our disposal and the work was pushed ahead with new vigor.

Alice and I made a number of trips down the huge shaft, but really there was nothing to see. After the first drop when we passed the top soil, there was nothing but an endless monotony of rock. Rock, rock, rock! There literally miles of it. It was a depressing sight and besides, it was cold at the bottom. If proof were needed of the truth of the Professor's theory, the rapidly decreasing temperature abundantly supplied it. The growing air pressure in the shaft as it went deeper added to the discomfort and we were soon content to remain on the surface.

Six years passed; and at the end of that time we had gone to a depth of over thirty miles. The temperature of the bottom of the shaft was below the freezing point of pure water and almost at the freezing point of the brine which we encountered from time to time at the lower levels. The presence of this brine was, to the Professor, additional proof of the correctness of his theory. He explained that the semi-permeable membrane which were striving to pierce was probably not a perfect one and that it allowed some of the salts to seep through it, accounting for the briny condition of the water at the lower levels. The fact that the brine was getting more heavily impregnated with salt as we went lower was also proof that we were nearing the end of our work.

The years had not been altogether quiet ones. Twice we were attacked by tribesmen and once by regular troops under the Cantonese leader, Marshal T'Chung. Several times supply trains were cut off and destroyed. Our artillery and machine gun fire soon repulsed the attacks of the tribesmen, but when the Cantonese attacked, we were beleaguered for a week and it was only by a movement of Quan's loyal troops that the siege was ended. After we had lost a few supply trains we took to armoring our cars and carrying heavy guards on them. With the one exception, we were never in actual danger and work was never interrupted for more than a few days at a time.

On the day that we completed our one hundred and sixty-second level, a little over thirty-one miles underground, a conference assembled in the headquarters building to discuss further plans.

"I am afraid, Professor, that we have gone almost to the limit of our drilling," said Callahan. "The air pressure is so great at the bottom of the shaft that our men can stand very little of it. As you know, I have cut the working shift down to four hours and work them alternate days only. We may be able to go two or three miles lower, but there we will have to stop. The human system won't stand it, even with extensive and gradual acclimation."

"Fortunately," replied the Professor, "we have only a short distance left to go. From the measurements which I have made, measurements which have been checked by Doctor Darby of the Washington Bureau of Standards, I am confident that the membrane lies not more than a mile and probably not more than a thousand yards below our present level. There are only two things that worry me. The first of these is the alarming increase in seismic activity recorded all over the world. This indicates that the time of bursting is almost at hand. The other thing is that our rate of drilling has slowed down so much. There is need for the utmost speed, yet your reports show that our rate has fallen off to less than twenty feet in twenty-four hours."

"There is one thing that worries we more than either of the two things you have mentioned, Professor," I

interrupted, "and that is the political situation in China."

"That is nothing to worry about," said the Professor testily.

"I wish that I could think so," I said gravely, "but it has me worried. I am mighty glad that Alice and the boy are safe in the states and I wish that the rest of the women were out of here as well. I would send them home at once if I didn't think that they are as safe here as they would be traveling across China right now."

"Nonsense," replied the Professor. "There has been some fighting as I have gathered from your daily bulletins, but that is nothing uncommon. It is just another scrap between rival leaders for Peiping. It will blow over in a few days."

"Peiping fell this morning," I answered, hoping to surprise him.

"What of it?" he retorted. "Marshal Quan has lost the capital twice before since we have been working here but he has retaken it both times. He will be back in power in a few weeks and at worst it will be only a temporary interruption of our lines of supply. We are provisioned for six months and have enough oil stored to keep us going even longer, haven't we?"

An Ultimatum

CALLAHAN nodded.

"This is a little more serious than the previous squabbles," I said. "Each time that Quan has been forced out of Peiping he has been between us and the city and has been able to continue his protection. This time he has been driven out toward the sea and there is no one between us and the Cantonese. I think that the Nationalists mean business this time and I don't believe that Quan will make a quick come-back, if he ever does."

"How much have we been paying Quan?" asked Callahan.

"Two million a year in subsidies," I answered, "and the 'squeeze' has amounted to three or four million more. Since our money has kept him in power so long the Cantonese aren't likely to forget it."

"Won't a continuation of our payments to whoever is in power settle that?" he asked.

"I hope so. Of course, while Quan is between Tientsin and us, we must pay him as well. I hope that duplicate payments to T'Chung will settle the matter but I wish that it were any one else who was in command. He is a vindictive cuss and has a long memory."

"T'Chung?" asked the Professor, "Wasn't he the one who tried to collect from us two years ago?"

"Yes," I replied. "When we refused to pay he kept us cooped up here for a week; and if Quan's troops hadn't moved in our direction, it might have gone hard with us. If he attacks again, Quan is not in a position to come to our rescue."

"That's not so good," replied Callahan thoughtfully. "I expect that I had better take a look—see around our defenses today. We may need them in good condition and they have been rather neglected lately. Hasn't Quan got quite a good force between here and Peiping?"

"Yes, he has, or rather, he had. T'Chung walloped him so badly that they retreated along the railroad instead of going to the aid of Peiping and taking T'Chung in the rear. I doubt if they are over fifty miles from us, but they won't offer much resistance to a serious attack. If they are sure that Quan is a back number, they will probably desert to T'Chung in a body."

"I expect so," said Callahan. "I suppose that T'Chung will be putting the screws on us soon. Woudn't it be wise to beat him to it?"

"I have already congratulated him in the name of the camp," I answered, "and have told him that the subsidies formerly paid to Marshal Quan would be paid to him and requested his protection."

"Have you had a reply?"

"None as yet, but I could hardly expect one so soon. There is nothing to do now but sit tight and wait for him to show his hand. He may take the payments and everything be lovely."

"Wouldn't it be wise to inform the United States of the affair?" asked the Professor.

"I have already told our troubles to Manila, Singapore and Tokio," I replied, "and I have been promised aid from each place if it turns out to be necessary, but what good does that do? The United States has less than a division in the Philippines, the British have only a small force at Singapore and India is a long way off. Tokio would be glad of a chance to march an army into China, but even that takes time. They can't start until there are overt acts committed against us and then it will be too late. It would take quite a while for troops to fight their way from Tientsin to Ulan and even if they landed an adequate force the day that we were attacked, they might easily arrive here too late. There is nothing more that we can do except to be sure that we are in good shape for defense and then wait for things to happen."

"All right," replied Callahan as we rose, "I'll go over the military supplies and make sure that everything is in good condition and then try to go on with the drilling as rapidly as I can. Do you want to take any more measurements before the next shot is fired?"

"I think not," said the Professor. "The crust is pretty thin now and it may go on any blast. You are having everyone clear out of the shaft before a blast is fired?"

"I have done that ever since we left the hundred and fifty-eighth level," replied Callahan. "That is one thing that has slowed us down so much. At our present rate it will take a year to go down the mile that you estimate is still ahead of us."

"Hurry the drilling all you can," said the Professor. "Of course, I cannot predict with certainty, but I believe that the whole earth will go in less than five years unless we can relieve the pressure."

When we adjourned I went directly to the radio room, hoping for a message from T'Chung. No word had been received and I left the building and joined Callahan in his tour of inspection of our defenses.

"That is our weakest point," he said pointing toward a squat building nearly buried in the sand close to the edge of the shaft.

"That's a magazine, isn't it?" I asked.

"Yes, and it contains over thirty tons of nitro-glycerine and guncotton," he answered. "I should have disposed of it long ago, but I thought that we might need it and so I kept it here. It is cooled and cushioned against shocks and is pretty safe, but if a shell landed on it, there is every chance that it would turn loose. If it did, there wouldn't be anything left of the compound."

"Can't you get rid of it now?" I asked.

"I intend to," he replied. "I'll start a gang loading it on to dump cars in the morning and haul it down to the rock dump and detonate it. It isn't safe to have it around if we are attacked with artillery."

A messenger from the radio hurried up and handed me a dispatch which had just been received. I read it and passed it on to Callahan without a word. He read it and whistled softly.

"The old boy doesn't sound very cordial, does he?" he commented.

"Not very," I replied as I reread the message. T'Chung demanded three things; first a cash payment of twenty millions in gold within three days, second, a subsidy of a million and a half gold per month, and third, an impost duty of one hundred percent *ad valorem* on all imports, based on his valuation. Failure to promptly acquiesce in his terms, he informed us, would mean that he would at once confiscate our entire goods, take charge of the work we were doing, and expel us from the country.

"Of course we can't meet those terms," said Callahan.

"He doesn't expect us to," I replied. "I'll send him back a message in which I will offer a million cash payment in ninety days, and a subsidy of a hundred thousand a month. That will be a basis for bargaining. I am afraid that we may have to pay him heavier than we paid Quan, but that can't be helped."

"In the meantime, I'll start the men moving that soup," exclaimed Callahan as I started for the radio room. "I want to take it in small amounts and it will take some time to handle it all."

Approach of the Enemy

IN the radio room I composed my message to the Cantonese leader, adding to my proffered terms a suggestion that a commission be appointed to arbitrate the matter. I further suggested that he allow our supplies to pass his lines unhampered, pledging us to settle for all goods passed on whatever basis was finally agreed upon. I handed the message to the operator and he depressed his sending key and called Peiping. The buzzing of the message went on for a few minutes when there came a terrific explosion from the outside which shook the building. With an exclamation, I rushed out to the compound.

The miners off shift were hurrying through the gate into the compound, rifle in hand, ready for what might befall and on the wall above I saw gun crews ripping the breech covers hastily off the field pieces. I grasped one of the hurrying men.

"What is it?" I demanded.

"Blymed hif Hi know, sir," he answered. "Hi was tyking a nap when the bloody racket come hand Hi grabbed my gun hand 'urried 'ere, sir."

From overhead the alarm siren wailed. I turned from the man whom I had questioned and raced up the steps to the lookout tower. There I found Callahan, binoculars in hand, engaged in sweeping the country.

"What is it, John?" I demanded.

"An attack, I guess," he replied. "I'm not sure whether it's that or an accident. I had a dump car loaded with soup and started it on the down grade toward the dump with two men on it to handle the brakes. They were to unload when they got there, set a fuse for ten minutes and come back. The car let go about six hundred yards from here where you see the track torn up. It may have been an accident; nitroglycerine is touchy stuff; or it may have been an attack. I don't see anyone moving out there."

I took another pair of glasses from the rack and searched with him. Not a moving thing rewarded my search.

"I don't like to send men down there to investigate," said Callahan, "when there is a chance that it is an attack. I think that I'll load another car with soup and start it out alone. If it goes off, I'll be sure that it's not an accident."

He turned to give the necessary orders when an engineer ran up the steps.

"The petroleum has stopped flowing, Mr. Callahan," he reported. "The pumps are just sucking air."

"That settles it," said Callahan grimly, "that car was shot at. We had better be sure that everyone is in and then stand by for an attack."

There was no attack that night nor the next day, nor yet the day after. We tried sending out scouts, but they were fired on a few hundred yards from the wall and scurried back, fortunately with no casualties. We were thoroughly blockaded and isolated from the outside world but as yet no hostilities had been opened against us as we stayed within the walls of the compound. Work on the shaft was of course abandoned and every man brought to the surface to aid in the defence.

On the third day we received a reply from Marshal T'Chung. He made no allusion to the message which I had sent him other than to state that he thought I had misunderstood him. He repeated his former demands and reminded us that the three days he had allowed for the initial cash payment were up at midnight. Unless he received the money by that time he informed us that he would take over our property.

"We couldn't pay him by midnight even if we were willing to," objected the Professor.

"He has no idea that we will pay him," I replied. "He is merely looking for an excuse to attack us. He has not forgiven us for the thrashing we gave him two years ago. Besides, like a good many bandits, he doesn't believe that we are telling the truth when we tell the object of our drilling. He thinks that we are mining gold here and that we are getting rich."

"Have you sent for help?" demanded Callahan.

"Of course," I answered, "but sending is all that it amounts to. With T'Chung entrenched between us and the sea, it will take weeks for the nearest force to reach us. We will have to play a lone hand, I am afraid. If he contents himself with sending the tribes against us, I am not afraid of the outcome, but if he sends troops with heavy guns, it may not be so healthy here."

"How soon do you think he will attack?" asked Callahan.

"The tribesmen may be sniping at us any time now but it will be a week or ten days at the earliest before he can get troops here," I answered.

"Then I'll start the shovels to work in the morning covering up that soup magazine with sand," replied Callahan. "That is the thing that I am most worried about."

The next morning the steam shovels started their task of throwing sand over the nitroglycerine magazine. For an hour they worked without interruption

and then came a call from the sentry in the lookout tower. Callahan and I hastened up and we found that my guess as to the time of T'Chung's attack had been very faulty. The Marshal must have started his troops from Peiping as soon as he sent the first message and Quan's troops must have deserted to him, for coming along our track from Ulan was a train of flatcars. It did not require the glasses to determine that they were loaded with heavy artillery. The train stopped several miles from our camp, out of range of the seventy-fives which were the heaviest artillery which we had, and started to unload.

"Those guns are 4.7's or I miss my guess," said Callahan as he studied the operations through his glasses.

"There is at least one battery of six inch," I replied.

He whistled sharply.

"Apparently T'Chung means business," he remarked. "They are out of range of our stuff and yet they can pound us to pieces. I reckon that we had better try to arbitrate a little."

CHAPTER V

Unconditional Surrender

AS he spoke a power car detached itself from the Cantonese camp and rolled down the tracks approaching our camp. It bore a white flag and Callahan, the Professor and I went out to parley. When the car arrived an obese General accompanied by an aide dismounted and came forward to meet us.

The General dispensed with the formalities and compliments which usually hedge around a conference between members of the Celestial Kingdom and got down to business with a dispatch which would have done credit to a Maine Yankee.

"Marshal T'Chung demands an immediate and unconditional surrender," he announced, "and delivery to me, as his representative, of all of the treasure which you have amassed during the rule of the corrupt and degenerate Quan at Peiping. All of your machinery and arms must be delivered intact with the treasure."

"What are the terms offered for our surrender?" I asked.

"I offer no terms," he replied. "You are entirely at my mercy. I will tell you, however, what you may expect. The three leaders of the enterprise, whom I expect are you three, will be taken as prisoners to Peiping in irons, to answer to Marshal T'Chung for defying him two years ago. Your women will be sold to my officers for their harems and your men will be stripped of arms, food, water and shoes and turned loose to find their way to their homes."

"That means death for all of us except the women and worse than death for them," I replied.

"Unless you surrender at once, I will start bombarding as soon as my guns are emplaced," he replied. "In that case, every man who is captured will be put to death by torture and your women will be stripped naked and turned loose in our camp for the sport of the common soldiers. I must have an immediate answer."

"Give us an hour to consider the matter," I replied.

"I will give you one minute," was his answer. "Unless you have surrendered in that time, I will go on with my bombardment. My men need artillery practice and a refusal would please me more than a surrender."

"In that case," said Callahan hotly, "I will give you just ten seconds to get out of range before I start shooting."

He drew an automatic pistol from his pocket and cocked it, his eye on his watch. The General paled and then turned and ran at full speed for his waiting car. Callahan kept his eye on his watch for ten seconds and then very deliberately raised his pistol and took aim. I grasped his hand just as the gun went off and the bullet flew wild.

"Why didn't you let me scrag the devil?" he demanded, turning on me furiously.

"He was under a flag of truce," I objected.

"A flag of truce doesn't protect a monster like that," he fumed. "If I had bumped him off, it might have delayed matters a little."

"Lawrence was right," said the Professor. "The question now is what are we to do?"

"Hustle back under cover," said Callahan shortly. "We'll have a lot of high 'ex' about our ears soon or I am badly mistaken."

Callahan was not mistaken. Within thirty minutes of our interview the first shell was fired from the Cantonese camp. It screamed overhead and exploded half a mile beyond the compound. The next shot was closer and the third landed full in the compound, doing no damage, however. Our seventy-fives were raised to their maximum elevation and fired but our shells fell a mile short of the nearest enemy gun. Again and again the shells fell in the compound, one of them hitting a steam shovel which was still working at top speed trying to cover the soup magazine before the entire compound was wiped out of existence.

"Better send the women and everyone except those needed to guard against surprise down the shaft to the first level," said Callahan to me as we watched the course of the bombardment. "It is only a chance that a shell will fall in the hole and it will detonate against the side if it does."

"At that, if it struck against the side, fragments of rock would be thrown all over the shaft," I pointed out.

"You're right," he said as he considered the matter. "This is probably as safe a place as any. I don't think that any of us will ever see home again."

"As it is written, so shall it befall and in no other wise," I quoted. "Isn't there anything that we can do?"

"We might try a counter-attack," he replied, "but I don't think it would do a great deal of good. If we made an attack for three or four miles across open ground, there wouldn't be many alive by the time we got there. Even if we could get our whole force there intact, we would be outnumbered too greatly to enable us to do much damage."

"All the same, I'm in favor of trying it," I answered. "This business of sitting here waiting for a shell to come over with your name on it is worse than advancing under shrapnel fire."

"I'm not worried about a shell with my name on it," he replied, "the thing that I fear is a shell with the soup magazine written on it. When that comes, we all go to glory on the tail of a kite."

The bombardment continued in a leisurely manner. Shell after shell struck the headquarters building and tore sections from it, but the structure did not fall. As soon as the bombardment began to center on it we discussed moving the women and other non-combatants from it under the shelter of the stone wall, but decided to leave them for the time in a room on the ground

floor on the side of the building opposite to that which the shells were striking. The garrison gathered behind the wall. Besides the thick wall, some fifty feet of sand had drifted up against it on the outside and the few shells that struck it detonated in the sand throwing a huge cloud of sand into the air but doing no damage.

By mid-afternoon, the suspense was more than I could bear. We had suffered only a half dozen casualties and were in no immediate danger of being overcome or even injured except for the ever present danger that the nitroglycerine magazine might be struck by a shell and exploded. We were glad that we had not sent the non-combatants down the shaft for half a dozen stray shells had fallen in the opening and had detonated a few yards below the surface. The shovels had covered the magazine to quite a depth and we had done all that we could to assure our safety.

After consultation with Callahan, I called for volunteers for an attack on the enemy guns. All of the men were eager to take part in it, anything being preferable to sitting waiting in anxiety every minute lest a shell hit our one weak point and demolish everything within our walls. Callahan advised that we wait until night. Then we would have a chance to cover at least a portion of the distance separating us from the enemy before our party would be discovered and shrapnel poured on us. We agreed to this, although the monotony and strain of waiting was so great that death seemed almost preferable if it were accompanied by action.

The Attack

WHILE we were discussing the matter of postponement a six-inch shell came hurtling overhead and fell full in the shaft.

"I wish they'd all go there," I remarked to Callahan. "They do less damage there than elsewhere."

He grunted an assent and went on talking. Another shell, apparently from the same rifle, came over and fell into the pit. A third and fourth took the same route.

"That chino is evidently satisfied with his aim," remarked Callahan.

"I hope he keeps his gun pointed there," I laughed.

"They're crumpling the edge of the shaft a good deal," he replied. "I hate to think of that rock falling on the relay stations."

"I don't see what difference that makes," I said. "I don't think we will ever work on them again."

"Probably not," he assented, "but some one else will and I don't like to have my work butchered up that way."

A moan from the siren broke up our conversation and brought everyone to his feet.

"What is it?" shouted Callahan to the lookout.

"It seems to be an attack," the sentry shouted. "The flatcars which carried the guns were coming down the tracks and they are loaded with men."

The crews ran to man their guns while Callahan and I hastened to the lookout tower. There was no doubt that an attack in force was pending. Car after car, brown with khaki-clad humanity rolled down the tracks toward our camp. Almost at once the guns of the Cantonese lost their lethargy and the shells began to pound the compound as rapidly as the guns could be served. A portion of the headquarters building crashed to the ground and Professor Hurlburt, who had been put in charge of the non-combatants, appeared on the

"Under the shelter of the wall, Professor!" shouted Callahan.

He nodded and disappeared. In a few moments the women and children appeared and ran across the compound and took shelter under the wall facing the hostile guns. Fortunately the maneuver was accomplished without anyone being struck by the shells which were now falling in the compound by the dozen.

Just out of range of our seventy-fives, the flatcars stopped and the soldiers swarmed off and arranged themselves in a thin skirmish line and began the advance. We had plenty of ammunition, both high explosive and shrapnel, so our guns started to talk as soon as the advancing line was in range, but one might as soon try to hit the mote in a sunbeam as to hit those specks scattered thinly over the sand of the Gobi. Once in a while a high explosive shell would make a direct hit or a shrapnel would burst just right and one of the advancing soldiers would lie motionless on the sand, but the losses of the attackers were no greater than ours, for now and then a fragment from a bursting shell would find a target in one of our men.

A few hundred yards behind the first wave of Cantonese, another wave formed and behind them, a third. Altogether, as near as we could estimate, six thousand men were advancing to the attack.

"When the beggars get within machine gun range we'll be able to do a little more damage," remarked Callahan as he leaned over the parapet and studied the advance, "but at that, if they know enough to keep that formation, we won't be able to stop them. As soon as they come within rifle range, their covering fire will keep us from doing much."

Slowly but steadily the advance continued. Our machine guns opened fire but against such scattered personnel they did little more damage than had been done at longer ranges by the field guns. Presently the crackle of rifle fire was added to the drumming of the machine guns, but the Cantonese were firing too and were lying prone for the most part, advancing only by short rushes under the covering fire of the prone men. As they came within range the second line added its fire to the fire of the front line, while the third wave rapidly closed up to firing range. Our men, who had to expose themselves a great deal in order to fire successfully, suffered heavily.

"We'll have to advance to the edge of that sand or the front wave will be in a dead space soon," shouted Callahan in my ear. "Come on, you men, follow me!"

He leaped over the wall onto the loose sand and started forward, I following at his heels. We had taken only a few steps when a four-point-seven shell struck the sand before us and exploded. By some sort of a miracle neither of us were hit but we were thrown clear back over the wall into the compound. I struggled to my feet, but Callahan strove unsuccessfully to rise.

"Hit, John?" I asked as I bent over him.

"No, but I think that my leg is broken," he answered. "Don't stop to fuss with me, go ahead and take charge of the men!"

I bent over him and tried to lift him but as I did so I saw something that made me drop him and cry out in surprise and alarm.

"What is it?" he gasped.

"Look!" I cried. "The magazine!"

He looked in the direction in which I had pointed and was smitten dumb. The shells which had fallen in

the shaft had crumbled away the edge to such an extent that the sand which we had filled around and over the magazine had been sliding down into the bowels of the earth for some time. The magazine itself had finally been undermined and as we watched it slid slowly toward the edge of the shaft. Nearer and nearer it went until it hovered for an agonizing moment on the brink and then toppling forward it fell into that thirty mile deep hole.

With strained nerves we waited for the crash. No sound came from the hole and Callahan drew a long breath.

"If it fell straight enough to clear the relay levels," he muttered, "Lord! What a crash it will make in a few minutes when it strikes. Leave me now and take charge of the men."

The Deluge

THERE was nothing that I could do for him and I climbed rapidly over the wall and hastened to the edge of the sand parapet. The first wave was within four hundred yards and a rush was evidently imminent. Presently it came. With a shout the khaki-clad figures leaped from the ground and came forward at a trot toward our defences. From our line the rifles burst into a fury of fire mingled with the rattle of a dozen machine guns which had been brought up to bear on the attackers. They came forward with dogged perseverance but no one could stand the withering fire we poured into them and presently the line halted and dropped prone on the sand and opened fire on us. Under my orders, all but a few of our men crawled back on the bank until they were hidden from the sight of the attackers.

Again the Cantonese line rose and moved forward, this time at a slow run, but a shout brought our men back onto the firing line and the attack crumpled within a hundred yards. Again our men retreated out of sight, but the first line of the attack was now within two hundred yards and it was evident that a few more determined advances would bring them on us and that we would face a hand to hand conflict with an overwhelming force. The Cantonese artillery shifted its angle of fire and shells began to fall on the parapet among our men. Our casualties were mounting at an alarming rate.

As the first shells fell among our men the Cantonese gave a cheer and rose and came forward at a run. Our rifle and machine gun fire took a heavy toll from them but they were within a hundred yards and coming strong when suddenly the whole line fell flat. As they did so I realized that the earth under me was shaking and trembling like a sea in a gale. Giddy and seasick I tried to scramble to my feet. As I did so, a roar as of all the thunder in the universe smote my ears. I thought that the end of the world, so long predicted by the Professor, had arrived. Instinctively I looked back toward the compound.

I don't know how to describe the scene that met my gaze. Imagine, if you can, a solid column of water, a hundred yards wide and fifty yards through, shooting up into the air with an unheard-of velocity at a height of at least a mile! Such was the sight which greeted me. As solid as rock it looked, and it kept coming! The Cantonese who were facing it saw it before I did and as fast as terror and the surging of the land would allow them they staggered to their feet and fled.

Some one clutched my ankle and I saw that it was the Professor. His face was lighted by a beatific smile with which anxiety was strangely mingled. He was evidently trying to get some message to me but the roar of the water was so great that it drowned out his voice. Presently I saw that he was pointing upward and then toward the compound. I looked up and understood. A strong wind was blowing high across the compound toward the Cantonese camp and the water column was inclining forward so that it stood almost directly over us. When it fell, we would be almost in the path of the deluge!

I nodded and moved along the line, shaking man after man and pointing to the compound. They soon saw their danger and crawled hastily toward the edge of the shaft, carrying the wounded with them. So high did the column rise that every one of our men was safe within the walls before the first of the water hit the ground with a crash that resounded even over the roar of the geyser.

Followed by the Professor, I clambered up into the lookout tower. The wind carried the water away at such an angle that we could see the Cantonese camp. They were hastily trying to get their guns onto the flatcars but from the start it was evident that they were doomed. Our camp was built on a little knoll and the railroad ran through a dip in the ground toward a pass in the Great Khingans. The Cantonese had not moved from that shallow ravine and down it was now pouring a torrent. Some of the water seeped into the thirsty sands of the Gobi as it fell but no sands could absorb a torrent of that proportion and like a millrace the water rushed toward the doomed camp. The attacking waves were swept away and presently the wheels of the guns were in water. Then came the flood. The danger from our attackers was over, for the army of Marshal T'Chung had ceased to exist.

I made my way toward the spot where I had left John Callahan. As I approached I saw that he was laboring under great excitement. I thought that it was due to the phenomenon we were witnessing but as I leaned over him he seized my head and twisted it upward. I looked and far overhead, well to one side of the great column of water, hovered three airplanes, bearing on their lower wing surfaces the welcome emblem of the United States.....

Three months later we sat in the sitting room of the Professor's suite in the Mayflower Hotel in Washington.

"Of course, the giving away of the rock skin and the consequent puncturing of the membrane at such a time was fortunate in the highest degree," said the Professor, "but it hardly surprised me. I knew that the skin was getting thin and I would not have been surprised to see it go at any shot. You may ask why I took no precautions against a flood overwhelming us. There were none to take. We were on the highest point of the ground in the neighborhood and any other place would have been more dangerous than the compound, as the event proved. By the way, Lawrence, I can now answer the question you asked me seven years ago as to the composition of the center of the earth."

"I know it as well as you do now," I smiled. "I would like to have you tell me, however, the composition of the membrane."

"I can't do that yet," he replied, "and I doubt if I will ever be able to. The latest reports are that the

geyser which we loosed is flowing a steady stream but is no longer spouting to a great height. Naturally the great internal pressure has disappeared and the present flow in caused by the gradual contraction of the earth's interior as the stretch which the ages placed on the rocks is disappearing and by additional dilution of the core by the gradual seepage of water through the membrane. I am afraid that we could never pump our hole dry and there is no other way to determine the character of the membrane, unless we sink another shaft to it and take samples. Of course, if John wants to tackle another shaft, I think that I can raise the funds for him to work with."

"Thanks," said Callahan dryly, "I have had about all of the interior of the earth that I care for. There is plenty of work to do on the surface. When you released the pressure and let the earth's interior shrink an appreciable bit, you made enough work to keep a good many engineers busy repairing the damage done to the seacoasts. We were lucky that our eastern seaboard escaped so lightly. Before I do any work, however, I am going to take a nice long rest. I haven't had a vacation for seven years and since I have been granted an annuity of a hundred thousand a year, I am going to do nothing but loaf for the next two years."

"I am going to get back to work as soon as possible," said the Professor. "I am sick of attending banquets and receiving medals and decorations and listening to laudatory speeches from the very men who damned me completely less than a decade ago. I am going to found a research laboratory for the investigation of all ideas which the scientific bodies pronounce foolish."

"Since your proof of the osmotic theorem, you won't find them so quick to oppose things they don't know about," I laughed. "You have taught the scientific world a lesson."

"Yes," he replied with a touch of acid in his voice, "a lesson which those with the longest memories will remember for perhaps a year, perhaps six months. Mark my words, Lawrence, the next genius who comes forward with a revolutionary idea which runs counter to the accepted theories on which the average scientist rests his reputation will meet with as cold a reception as I did. You can't teach an old dog new tricks and you can't force a new belief on the world without occular demonstration and even then, half of them won't believe their eyes."

And after thinking it over and reading some of the commentaries which have already appeared on our work in the Gobi, I believe that the Professor is right.

THE END

What Is Your Knowledge of Science?

Test Yourself by This Questionnaire

1. What is the distance from us to Vega? (Page 155).
2. What is the ratio of the amount of light admitted by a lens 1200 inches in diameter to the amount of light admitted by a lens 48 inches in diameter? (Page 160).
3. How long does it take the moon to make one rotation on its axis? (Page 161).
4. How many miles in diameter is the greatest crater on the moon's visible hemisphere? What is its name? (Page 161).
5. How could it be determined if a rocket sent to the moon had arrived? (Page 173).
6. What, approximately, is the estimated temperature of the cold "outer space"? (Page 177).
7. What are compound lenses made of? What is the reason? (Page 155).
8. Name some of the craters and parts of the moon. (Page 158).

Into the 28th Century

by Lillith Lorraine

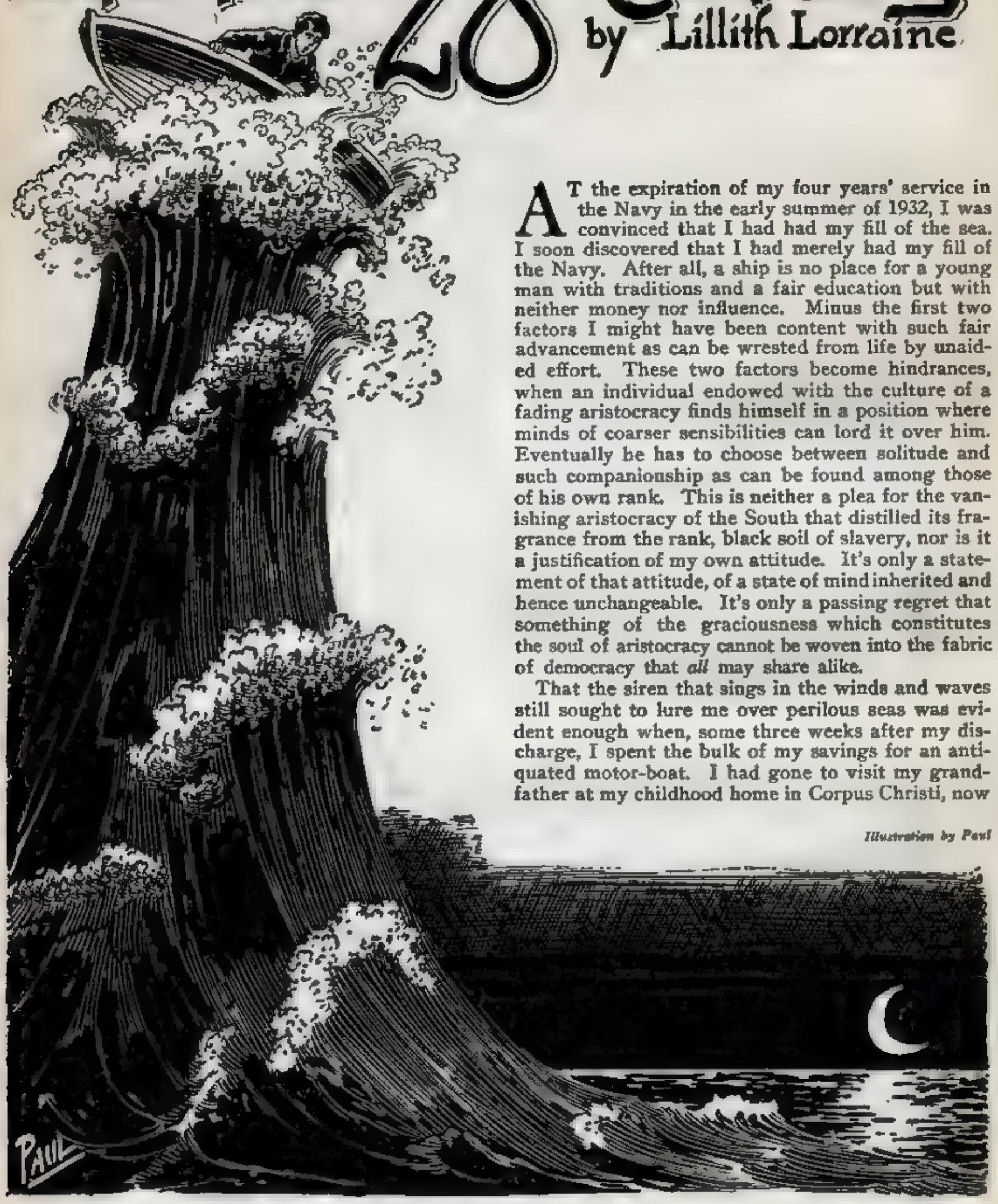

Illustration by Paul

AT the expiration of my four years' service in the Navy in the early summer of 1932, I was convinced that I had had my fill of the sea. I soon discovered that I had merely had my fill of the Navy. After all, a ship is no place for a young man with traditions and a fair education but with neither money nor influence. Minus the first two factors I might have been content with such fair advancement as can be wrested from life by unaided effort. These two factors become hindrances, when an individual endowed with the culture of a fading aristocracy finds himself in a position where minds of coarser sensibilities can lord it over him. Eventually he has to choose between solitude and such companionship as can be found among those of his own rank. This is neither a plea for the vanishing aristocracy of the South that distilled its fragrance from the rank, black soil of slavery, nor is it a justification of my own attitude. It's only a statement of that attitude, of a state of mind inherited and hence unchangeable. It's only a passing regret that something of the graciousness which constitutes the soul of aristocracy cannot be woven into the fabric of democracy that *all* may share alike.

That the siren that sings in the winds and waves still sought to lure me over perilous seas was evident enough when, some three weeks after my discharge, I spent the bulk of my savings for an antiquated motor-boat. I had gone to visit my grandfather at my childhood home in Corpus Christi, now

Suddenly, without warning, the thing happened. I felt a checking of my speed, a sickening lurch as the boat shivered beneath me and shot straight upward under the pressure of a shining column of water.

a newly opened deep water port on the coast of Texas. My father was long since dead, and my grandfather's only surviving child, my aunt, was somewhere in the Orient. She had always been a wanderer, writing when the mood swayed her. There was always a sort of unspoken understanding between us and because of this, I have chosen her to give my story to the world. When it reaches her I shall be—elsewhere.

The glory of sunset and moonrise over Corpus Christi Bay remembered from of old, and the thrill of rushing through its phosphorescent waters leaving behind a trail of radiance like a comet's tail, might have been the subconscious allurement impelling me to purchase the motor-boat. Dutifully, I decided to spend my mornings and afternoons pursuing an elusive job and my other hours cruising around the bay and the nearer waters of the Gulf. Had I foreseen the unprecedented, inexplicable happenings that were to follow in the wake of my investment, I might have hesitated before paying that departing tourist the ridiculously low price he asked.

Still, I regret nothing, provided I can get back. If I succeed in that, which will involve my disappearance from the world, my aunt will give this document to the public. If I cannot get back, no one will ever know where I was for exactly forty-eight hours between the tenth and twelfth of May, 1932. If I tell this tale at all it will be told at a safe distance. Even then my aunt will be instructed to label it "fiction" lest she be incarcerated in a mad-house or arrested in connection with my disappearance. Nevertheless, there is a small circle of her acquaintance who know the real facts underlying much of her "fiction" and these few will be interested in my adventure from a scientific standpoint. Others will regard it as the wildest imagining, but what does it matter? He who tells a man a truth which he is not ready to receive, tells him a lie, but he who garbs truth in the raiment of fiction sometimes teaches the soul a lesson.

The moon was just beginning to rise over the water as I put out to sea in the very early morning of the 10th of May. The old craft was humming along fine. I was lost in the beauty of the night and wrapped in the seductive mystery of the stars. My imagination was racing along like the phosphorous stream that cut a swath of radiance through the sea. Suddenly—without warning—the thing happened! I felt a checking of my speed, a sickening lurch, the boat shivered beneath me, reared and shot straight upward under the pressure of a shining column of water that carried me fifty feet nearer heaven than I ever expect to be again. Then slowly—ominously—the column of water subsided, carrying me down far more gently than I had ascended, and leaving me flopping around in the middle of the Bay. The boat was nowhere to be seen. It had simply vanished.

The next thing I noticed was the brilliance of the sun. All at once I remembered that the moon had been shining when I "went up." Thinking perhaps I had been momentarily stunned, and was merely suffering from the illusion of brightness, I began to take further stock of my surroundings. Imagine my consternation when I saw coming straight toward me, a great craft resembling a warship. Yet its design was very strange. But I couldn't help wondering what a warship, probably of a foreign nation, was doing in Gulf waters. Even more uncanny than this was the fact that she flaunted a coat of shining gold paint for all the world like a 1930 Ford. Of course, it might have been the sun in my eyes, but even then by all the laws of Nature there shouldn't have been a sun to be seen at this time of night.

For the next fifteen minutes I was too busy getting rescued to think much about midnight suns, golden battleships or anything else. Finally I was "hauled over" and dumped unceremoniously on the deck. I rubbed my eyes and looked about me. Then doubting my senses, I rubbed them again.

Crowding around me were a group of some fifty young men and women with hair of every color of the rainbow—red, green, yellow, purple and inter-

LILITH LORRAINE

IT is always most interesting for us to dwell upon the thought what our world will be like in centuries to come. From past history, we must assume that if the world is to exist, and civilization is to go on, things must become better and better in many respects in the future than they are now.

The present author has given us a most charming tale for the world of the future, and incidentally, has woven through the story a fourth dimensional plot, which every reader will find most interesting.

Endowed with imagination, there is little contained in this story that you will find difficult in believing and most of the things so vividly pictured by this author that they take on an air of reality.

And incidentally, it speaks well of the times in which we are living, when women authors such as Lilith Lorraine have the vision to take science fiction seriously enough to make extended studies of it.

vening shades unknown to me. Both sexes had curls falling to their shoulders, but the boys, notwithstanding, did not convey the impression of effeminacy. They were perfectly formed, athletic, muscled and gracefully lithe. The girls were a combination of Venus de Milo and Diana the Huntress. What I mean is that their forms were neither angular nor voluptuous but carried that dual appeal to both the senses and the soul that comes only from the blending of the most refined spirituality with the most perfect health. They were of those pleasing proportions that combine both softness and strength and suggest power expressing itself through delicacy. Both sexes were unusually tall, yet formed proportionately.

The girls' costumes—I couldn't think of their apparel as clothing—had the classical lines of the Ancient Greeks, simple—clinging—revealing—almost devoid of ornament. The boys were garbed in abbreviated tunics cut somewhat after the Roman fashion and made of a shining material that resembled scales of gold. A graceful cloak was thrown across the shoulders. Both sexes wore sandals of a silver or golden sheen evidently designed more for ornament than for use. Bracelets and even anklets were in evidence but not in profusion. Around the heads of the young men were plain gold bands set with a central jewel whose scintillating splendor I have never seen matched before. The headdresses of the girls were varied, consisting of gorgeous plumage rivalling the feathers of birds of paradise, wreaths of flowers so fresh and beautiful that at first I thought them natural, or long transparent veils of rainbow colors held in place by golden circlets.

My first illogical idea was that this might be a motion picture company in the costume of another age—but what age? These youthful god-like beings had robbed all the ages of their choicest secrets of adornment and had magically blended them into one harmonious galaxy of grace.

Any further dazed impressions that might have come to me were interrupted by the sound of voices—English voices. A green-haired damsel of bewildering beauty was executing a war-dance right in front of me and crying out in a high extremely musical voice vibrant with excitement:

"Well! We've got it! Roped it in! Captured it! Style of the twentieth century! Pants! Shirt! Shoes! Everything!"

"Oh, do be quiet, Iris!" interrupted a well modulated voice that I later discovered belonged to a young man called Therius. "He may be hurt—frightened."

This friendly evidence of civilized consideration loosed my paralyzed tongue but all that I could accomplish in the way of speech was the trite old formula, "Where am I?"

"You're just about where you were before, comrade," replied Therius, "so far as space is concerned. In regard to *time*, however, you are, if I place your epoch correctly, about 800 years in your future."

The Golden Age

REASON rebelled against this preposterous joke that I thought was being played upon me.

"Impossible!" I retorted. "Why this is a modern battleship."

"Of your age?" questioned Iris with the wide-eyed serious simplicity of a child.

I began to feel decidedly queer. At least these people were not joking, whatever else might be the matter with them.

"Certainly it might have been of his time," remarked a gorgeous purple-haired young princess. This boat was used to carry on their wretched wars in about 1980—to murder each other, you know, to appease the fetishes that they called patriotism and democracy and——." She faltered for lack of the right word.

"Hundred per cent Americanism," tersely supplemented Therius.

At last I realized that there was something more to all this than a practical joke and that these young people had nothing in common with my day and age. Still slightly dazed, I staggered to my feet, assisted by the friendly hand of Therius. Another youth brought me an enormous velvet cushion and indicated that I was to be seated upon it. The other young people likewise appropriated numerous cushions that were lying around the deck in Oriental profusion. They grouped themselves gracefully around me gazing into my face with the eager, smiling expectancy of highly intelligent children.

"How did I get here?" I demanded, determined to satisfy my own curiosity first.

"You were accidentally captured," said Therius who seemed to have elected himself spokesman. "You were literally snatched out of your dimension out of your time, into ours. Our time flyer had been left open and at your period and was therefore receptive to anything which might have been in the neighborhood subject to its pull."

"This invention," I questioned excitedly, "is it a machine?"

"Certainly," replied Therius. "Why way back—shortly after your time, science and metaphysics declared a truce and united their forces. They realized at last that the wind power of the latter could operate only through the instruments of the former. By different routes the ancient rivals had arrived at the same truth, namely, that to operate through time, energies must be provided with material instruments through which to function. Science eventually had perfected machinery so delicately sensitive that the hitherto uncaptured elements of the time curve could be conducted through the centuries as electricity was captured and directed through wires. But science, having neglected the laws of mind, did not know how to so concentrate and focus this energy as to make it usable. So they turned to the metaphysicians, who through the centuries had been studying and perfecting the laws of mind and finding them as definite and invariable as the laws of chemistry. Thus ended the warfare between science and metaphysics through the mutual discovery that each school had what the other lacked.

"It was—just after radio—" he explained rather haltingly, "that the first thought-transmitters were put into practical operation, and—just before Socialism, they began to run nearly all machinery by means of thought-vibration. During the final revolution known as the Revolt of Youth, the deadly disintegrating ray controlled by thought-power was

invented by the rebel scientists and turned the tide of victory in their favor.

"After Socialism, when the need for government save in its broader sense had practically vanished, the re-integrating ray was discovered and controlled by the same process. Finally, what we thought to be the summit of human achievement was attained in the so-called 'creation of matter' through the materialization of thought. *Now* we know that there is no end to the unfoldment of the divine potentialities within us, so long as we use them in the furtherance of the Undeviating Plan. You, yourself, are a living testimony that we have not only discovered and controlled the mighty energies of our own age, but have reached back through time and brought into the Golden Age a splendid representative of the age of gold."

With this graceful compliment Therius paused, but I still had many questions.

"This battleship," I asked him, mentally reaching out to it as to a tangible link that bound me to reality, "is it also navigated by thought-waves?"

"Of course. Everything is so operated. All our machinery, which is really quite simple, is nothing more or less in most cases, than thought-focussing crystals and thought-projecting mirrors. In your day machinery was so alarmingly complicated that the scarcity of it in even our largest cities, will, no doubt, astonish you. Of course, the great secret of our thought-machines lies in the composition of the crystals and the mirrors. They are made from a synthetic substance the key to whose discovery was found by experimentation with the so-called 'magic' crystals of the Orient. We found that their peculiar properties lay in the fact that they facilitated the concentration and projection of thought."

CHAPTER II

An Ageless Race

"WHY is this ship in such a remarkable state of preservation?" "And why," I asked him, "in such an obviously war-less age, have you seen fit to retain its accoutrements of destruction?"

"The golden substance with which it is coated throughout is the secret of its preservation. This substance and anything protected by it, is as indestructible as thought itself for it is thought materialized. We have preserved this battle-ship and its war equipment along with several other gruesome relics of your time, for historical purposes."

"Good Lord," thought I, "if its old crew could only hear the ship called a gruesome relic."

"We are using it also," he continued, "as a sort of floating university. We have junked its clumsy machinery, of course, and turned that space into a gymnasium and a reading room. Our regular college curriculum requires a year of travel during which our students visit all the important centers of the world-state. Thus it has come about that this old battleship represents the University of Nirvania, of which institution I have the honor to be president."

"You! Its president!" I cried incredulously, "Why you are only a boy yourself."

"I may seem so to you," he answered smilingly, "but I shall be ninety-six my next birthday. We have discovered the secret of rejuvenation, hence, you will never witness the crumbling spectre of old age among us. Disease and death have retreated far back into the charnel-houses of antiquity along with war, and poverty and greed."

"But 'death!'" I exclaimed incredulously, "how have you conquered it?"

"Well, generally, the process has become automatic." He seemed to be searching for words to convey to my complex mentality a truth divinely simple. "Why, it just doesn't *come*. When we discovered that mind is the creator, controller and destroyer of matter, we began to study and apply the *laws* of mind. The whole secret is contained in a verse of a Book you folks once set great store by but never proved its truth. This Bible of yours said 'Be ye transformed by the renewing of your minds.'

"Human-like we didn't find the secret there. In those days we preferred to grope through the labyrinthine mazes of science rather than to take the straight and narrow path of revelation. That would have been too simple and we are out for complexity. The new school of psycho-analysis after it had discarded quackery and settled down to serious investigation, satisfied all our yearnings for complexity. It delved down into the musty catacombs of our twisted brains and brought out the gibbering ghosts of dead desires that we had thrust back into the slime of the subconscious, afraid to face the facts of our own natures. Man finally began to live normally, and better than all, he no longer carried with him the burden of the *consciousness* of sin. 'We are not fallen gods,' we courageously asserted, 'we are risen beasts. As the water-lily pushes upward from the ooze of the river-bed, so the soul of man has emerged from the primeval slime and has pushed upward to the sun.' This we have done because of that Spark within us that has burned steadily in the darkness of savagery even as now it flames in laughter and in light. Thus we left behind us the clanking chains of impure thinking that had been fastened on us by the festering moralists. At last we realized that *all* of God's works are perfect, that to impute impurity to any of God's manifestations is to impute impurity to God Himself, to poison the stream of life at its sacred fountainhead."

I stared at him open-mouthed. Was this man mad? Were they all mad? He seemed to divine my thought. "Hear me out," he said.

"When our mentality changed our institutions changed accordingly, though not so peaceably, as you shall presently learn. Our innumerable agencies of repression became channels of *expression*, glorified expression on higher planes.

"At last it happened that the physical ills that follow in the wake of mental repressions, in the wake of the consciousness of impurity, vanished along with the mental stagnation that had breeded them. For we had learned that mental stagnation—crystallization—is death, and mental plasticity—eternal flux of mind, is youth eternal. Thus were we transformed by the renewing of our minds, by the eradication of the prejudices, intolerance, impurity and bigotry that caused the soul of man to shatter its crystallized instrument in its struggle to expand.

"Long before this, science had eradicated the

germs of contagious disease and had purified the blood stream of hereditary contamination. The only ills remaining were imaginary ones and all that was needed to insure immortality was to purify the imagination. Scientists even in your day, had boldly stated that there was no inherent necessity for death—our scientists proved that statement.

"Notwithstanding, even now we become a little emotionally twisted at times. I say *emotionally*, because we have purposely kept alive our emotions. We have deliberately intensified and refined them until we have attained a capacity to enjoy and suffer that would have spelled madness to those of your day, when there was so little to enjoy—so much to suffer. But when we get mentally twisted now-a-days we just go to a specialist and get taken apart and re-assembled, the same as when we have an accident."

"Taken apart! Re-assembled!" I gasped. "What do you mean?"

"We go and get our mental twists removed," he explained. "By a process of psychoanalysis, highly refined mental twists are straightened out just as any twisted thing is. It is nature's law that the parts of any given organism will continue to vibrate in perfect harmony with each other unless some foreign influence disturbs their relations. In the human organism, perfectly adjusted to its environment, this distortion, this disharmony which produces disease and death can occur only through mental or emotional perversion. During the restorative process following the untwisting, our minds and emotions automatically resume their natural relations to each other, just as a spring would return to its normal state once pressure is removed. Our physical ills disappear, and the mind, aware of its errors and working consciously to rectify them, is in a position to make a fresh start. Ordinarily we can take ourselves in hand and iron out the kinks unaided, but if we let ourselves slip too far, we can always fall back on science."

"It's all too unbelievable!" I exclaimed.

"No, it's all too simple," amended Therius. "That's what held humanity back so long; expecting to find life's greatest truths most wrapped in mystery, in complexity. At last we had to learn that there is nothing complex in all God's universe except the twisted ideas of human minds."

A Twenty-Eighth Century Diet

"YOU speak of God," I told him, "why we had almost discarded God in my age. Surely you don't believe in a personal deity."

"Of course not. That would be an absurdity. But there is the eternal spirit in all things, the flaming essence that throbs and pulses at the heart of life; that dances in the atom, thunders in the tempest, holds the stars to their courses, the mind to its aspirations, the soul to its mate. It is that spark within us, within all humanity that has led upward through the long, dark aeons of frustration to the Splendor—and the Laughter—and the Light—"

His voice trailed off into ecstatic silence as his thoughts were lost in the inexpressible, and I knew that I was face to face with one who had seen—God. A reverent hush ensued for a moment as among those who are conscious of the benediction of an unseen Presence and the rush of mighty wings.

"You spoke of the change in human institutions," I asked him presently, "in what did this change consist and how was it effected?"

"That's a long story, and a sad story," he answered, "and I'm going to let Iris tell it to see how well she remembers her history lesson. The young lady's researches into the history of your time and the stormy period that followed it, have earned her an enviable standing in her class. But first let us inhale, or as you would say, let's eat. Althus, bring our new comrade a flask."

A young man left the group and returned in a moment with a jewel-encrusted flask of glittering beauty which he uncorked and handed to me. Under the impression that I was being invited to imbibe something forbidden by the 18th amendment, I raised the bottle to my lips.

"No! Don't drink it! Inhale it!" cried Therius. "It's the essence of food."

Embarrassed at my error, I raised the flask to my nostrils. Immediately my whole being was permeated by a delicious and seductive fragrance. In a few moments the pangs of hunger, which had been annoying me for the last thirty minutes, were miraculously assuaged. As I continued to inhale under the captivation of the delicate perfume, I began to experience a feeling of surfeit as one does who has over-eaten. I noticed that my companions, who had likewise been inhaling, were replacing their flasks in cunningly concealed pockets in their garments.

"Does this constitute your entire diet?" I asked Therius. "Oh no," he replied. "Although it satisfies every dietetic requirement, we can't resist the temptation of biting into the luscious fruits that over-burden our orchards and of partaking occasionally of the foamy conconctions and icy beverages that the ladies insist on serving at our social gatherings. It would be better—much better," he went on academically, "if we denied ourselves these pleasures. I have every reason to fear," he prophesied with the air of one predicting a cataclysmic disaster, "that if we continue these indulgences, somebody on this planet will some day be stricken with that ancient curse, the stomach-ache."

With much difficulty I restrained myself from bursting into hilarious laughter on observing from the serious expressions of these young people, that a stomach-ache would be a matter of international concern.

"By the way, comrade," said Therius, "you have not yet told us your name. I am called Therius, as you may have already gathered. This young lady," pointing to the beauty with the sea-green hair, "is, as you have heard me call her, Iris. This young man," indicating a striking looking youth, "is Heriod, and this lady," pointing out a purple-haired vision, "is Lyria. It is needless to present them all, for you would forget their names, but you will learn them all in time. We have, as you see, dropped the surname, and for purposes of distinction have made it compulsory to resort to a greater diversity of Christian names. And your name, comrade?" he asked again.

"My name," I replied, likewise omitting my surname, "is Anthony."

"Ah!" said Iris, gazing at me with a new light in her beautiful eyes. "It was Anthony who lost the world—for love."

"It is well lost—for love." I answered her—and what she saw in my eyes caused her to drop her own shyly while a faint blush suffused her cheeks. I was thrilled to the uttermost depths of my being that my green-haired sea-goddess had been chosen to relate the changes leading up to the divine perfection which she so gloriously symbolized. Something, old as creation itself, had flashed between us in that first direct meeting of our eyes, defying time and levelling dimensions. In a low, vibrant voice that my soul drank in like music, she began:

CHAPTER III
How It Happened

"YOU will naturally know more of the events immediately preceding and embracing your own time than we. Hence, I shall not take up the story until about the year 1950. Your day was called by later historians, the Age of the Great Unrest. It is especially interesting to us because in that epoch were set in visible motion the hitherto hidden forces that were to rock society to its foundation. From the very dawn of history momentous forces had been working in the shadow, shaping not so much the material destiny of man as the warp and woof of human character. These silent forces were dual. We have called them simply, as did some of your religionists, the Powers of Light and the Powers of Darkness. But you must understand exactly what we wish to signify by the terms we have appropriated. By the Powers of Light we understand all the innumerable agencies, visible and invisible, that have impelled man to broader freedom, greater happiness and more perfect unfoldment of the latent powers within him. By the Powers of Darkness we designate everything that impels the soul to limitation, the mind to intolerance, the heart to selfishness and the body to imperfection. All that man has accomplished materially, the institutions he has moulded, the battles he has fought, the creeds he has believed, the civilizations he has created and destroyed; all these are but the visible reflections of that higher conflict that has gone on in his own nature between the two forces I have mentioned. Yet, out of this very conflict with spiritual darkness, was generated the desire for its opposite, spiritual light. And with the desire for that light came the wisdom to recognize it, the courage to fight for it, the will to attain it.

"In your day the inner conflict had almost reached its climax as evidenced by the utter impossibility of remaining neutral. Like two opposing armies on the eve of a decisive battle, two mighty schools of thought lined up against each other. One school represented the soul-killing tendencies that had created standardization, competition and inhibitory creeds and institutions, which the soul of man had long ago outgrown and repudiated. The other school espoused the cause of higher freedom, greater tolerance and escape from standardization. Like a grim juggernaut crushing everything that stood in its path the chariot of diabolical 'efficiency' rolled on and either converted all men into cogs in its machinery or crushed them to powder under its wheels. In your day the odds were decidedly in favor of the Powers of Darkness. The World-Trust was beginning to emerge from the wreck of private ownership: absorbing independent enterprises and preparing to absorb the functions of government.

"All this would have been very well, had the right motive been behind it, had it been possible for the soul to emerge alive from the process. Surely the centralization of the means of production and distribution means the elimination of waste, the conservation of energy, and thereby the creation of leisure for the soul to expand. But it didn't work out that way. The same diabolical powers that had brought private ownership to its highest expressions, forseeing its inevitable decline, began to retract their own gospel. They established a travesty of Socialism; dictatorial, merciless; with themselves as dictators. Instead of shortening the hours of labor they employed an army of experts to devise new tasks of increasing complexity. With the collapse of private enterprise the former middle classes and finally the upper stratas of the social structure collapsed into the ranks of labor.

"To insure the continuance of their system, the dictators after binding men's bodies to their giant machines, began to attack the hitherto impregnable fortresses of mind. Always before in the course of history whenever human freedom had been seriously menaced, a leader had arisen. A thinker had always emerged, often from the very ranks of the oppressed, who keeping his mind alert, and his ideals uncontaminated, had inspired his comrades to revolt. 'But now——' so swore the Dictators in their secret councils, 'there shall be no more thinking on the part of the masses, save such thoughts as we, their masters, shall implant in the mass mind.' Controlling all employment, since the crumbling governments had long since disclaimed any responsibility in the matter of whether their subjects should work or starve; the Dictators finally issued what was later referred to as 'The Unspeakable Manifesto.'

"'We have created jobs for all'; they proclaimed grandiloquently, through the mediumship of the subsidized press. 'We have, therefore, suspended all the agencies of charity supported by our capital, for where there is employment for all, and compensation for such as we find unfit to labor, there is no further need of charity. There is no longer an excuse for idleness, and he who will not work must starve.'

The Unspeakable Manifesto

"YES, there were jobs for all, but at what a price! Oh, my comrade, that I might mercifully veil from your eyes this stain on civilization! But you must understand if you are to comprehend what followed.

"At this time surgery had reached a perfection hitherto unattained in the annals of science. The human brain had been probed and altered so that by means of safe and simple operations criminal tendencies could be eradicated and the channels of higher thought opened for the expression of latent genius. But no such altruistic motive guided the scalpels of the hired surgeons of the Industrial Dictators. To make a long story short, this is what they were employed to do.

"First under the guise of 'vocational treatments,' and later brazenly and openly under the name of

'vocational operations' they compelled every applicant for employment to submit to cerebral surgery. The aim of the operation was two-fold: to block the brain paths of creative thinking, and to concentrate all the energies of the mind on the particular task for which the victim was selected.

"Thus began the creation of a race of human robots, each a highly specialized machine for the performance of his appointed task, incapable to thinking on any other subject, and hence incapable of revolt or even discontent.

"This horror of the ages might have gone on until the humanity of our planet had become a soulless menace to the universe had not youth intervened. Even in your time the revolt of youth was beginning to assume alarming proportions. Toward the false psychology that had been deliberately foisted on the credulous masses through the channels of a corrupted press, a tainted educational system and a fossilized religion, the younger generation maintained a mocking indifference. If pressed too far this indifference flared into open rebellion. The age-old fetishes of the flag, the altar, and the home, were discarded by these clear-eyed, strong-limbed, clean-minded youngsters along with their belief in storks and Santa Claus. They had seen the flag used as an appeal to selfish interests, they had seen Mammon enthroned on the altar of God, they had seen the home desecrated and broken by the force of economic pressure.

"Between the youngers and the elders of that day a gap in evolution yawned and widened. The thinking processes of these youths were as logical as those of their elders were muddled. Their minds drove straight to conclusions, exposed the subtlest motives, and laughed in the face of superstition. In the dawnlight of their awakening they said that the idols of the elders had brought them nothing but chains and slavery. They boldly stated that if life were nothing more than a senseless circle of its own perpetuation; that if man's sole duty was to reproduce his kind, foregoing all happiness for the sake of those who must likewise forego all happiness for the generation that should follow them and so on *ad infinitum* then life was not worth living. They looked *back* of the life process and found its meaning. They proclaimed the gospel of human happiness as the purpose of life and the perpetuation of happiness as the *reason* for perpetuating life.

"They went too far, of course, in their rebellion. In their resentment against the old they often discarded principles which might have strengthened the fabric of the new. In their hatred of pain they often grasped the transitory pleasures of the moment rather than building for permanent and en-

Illustration by Paul

I raised my eyes to the scene we were approaching. It was Corpus Christi beyond a doubt. The coastline had changed little in 800 years.

during contentment. In time, however, they swung back to normal and by the time that the first cerebral 'vocational operations' were performed they had settled down grimly to the business of consistent, organized revolt. Everywhere that youth flaunted itself, rebellion flared, and youth was everywhere. Swelling the ranks of the army and navy, in the fields of scientific research, even under the parental frown of the Industrial Dictators; everywhere, rebellion spread like wild-fire. The cerebral specialists were hunted down like rats and death, swift and untraceable, met them at every turn. It was a case of father against son, of mother against daughter. The hypnotized elders had been thoroughly convinced that youth's rebellion against 'sacred institutions' was a contagious insanity that only the surgeon's knife could cure. Still bound hand and foot by creeds of fire and brimstone, they were inflamed by the hired ministers of Mammon to make a sacrifice of their children's splendid intellects, to save their souls from Hell.

"But youth was not alone in its conflict for many true reformers, scientists, and radicals rallied to its side. Yet, it must be borne in mind that it was the oncoming tide of youth that engulfed these movements rather than that youth enlisted under their banners. This accounts for the synthesis of thought that emerged from the fusion of these various philosophies into one mighty movement that was broad enough to include them all, and to unite them for one purpose.

"Then came war! Revolution, bloody and horrible beyond the dreams of Hell! Inventions of diabolic destructiveness were loosed on both sides, but it was a young scientist of the Rebellion who perfected the Disintegrating Ray.

"In the wake of this crumbling terror, vengeance followed swift and merciless. Armies melted into atoms, cities crumbled into dust and mountains toppled in the sea. It all culminated with that ghastly midnight carnage known as the Slaughter of the Ancients. Horrible and unnatural as it may seem, this annihilation of one generation by its offspring; it was a thing that had to be. Again the Inexorable Law had spoken. Nature herself had entered the lists on the side of progress and the fittest had survived.

CHAPTER IV.

The New Chivalry

"IN the year 1955 peace was restored to the stricken planet, reconstruction began, and the World-State elected a woman, known as the World President, as its Chief Executive. This was before the establishment of the monarchy.

"Any narration of the Great Revolt would be incomplete without a description of the changes that took place in the status of woman. In your day woman was just beginning to demand and attain economic equality with man. Shortly afterward she demanded and secured the establishment of a single code of morals. Man met these demands sullenly and retaliated for every inch of ground that he was forced to yield by a lessening of his chivalry. This only proved to woman that his chivalry was without any foundation save that of a sneering deference to weakness. The knighthood of the ages was but a sugar-coated pill that concealed a soul-killing poison, an opiate to drug the intellect. This discovery embittered woman and almost caused a war among the sexes. The ultra-feminists began to acquaint the world with the true status of the case. They began to demand chivalry, but not as an opiate to lull the reason into submission to a sex whose last claim to superiority had been undermined. They demanded it as a tribute still due to those who were *more* than equals, because of the sacrifice they still endured in giving birth to man. Man met this demand with taunts and insults. Woman gave him his choice between the restoration of chivalry and the surrender of his ancient privileges, even the surrender of his parenthood. She grimly stated that it were better for humanity to die painlessly through the ceasing of birth than to commit suicide through the continuance of man-made institutions.

"Chivalry was restored. There was nothing else to do. Notwithstanding, woman in her new bigness that had come to her through the broadening influences of her new freedom, was not inclined to add humiliation to her victory. She sweetened man's defeat with such queenly graciousness that eventually the new chivalry came to have a real foundation. Men, casting aside the childishness that had always made woman regard them maternally rather than as comrades, became real men, men who were big enough to give honor where honor was due, and in addition to chivalry came also mutual respect. Today in our new-found immortality with the burden of child-bearing practically lifted, woman is still accorded chivalry. This is necessary because of her more delicate organism, whose very delicacy must be conserved and perpetuated if she is to exercise, for the benefit of all humanity, her finer sensibilities. Woman has found her compensation for motherhood as the mother of the World-State. She is supreme in the realm of government. She has enlarged the scope of maternity and the four walls of her home to include the spiritual and intellectual guidance of our planet, the home of the human race.

"Naturally, the functions of government today, are as you have already learned, vastly different from its functions in your time. Concerned now with education, with the patronage of art, science and literature, with the beautification and spiritualization of all life; it finds in woman its ideal director. Man still leads in invention, mechanics, mathematics and the more strenuous sports. Woman has ceased to imitate man, being content in her own sphere. She has intensified her femininity, wherever it can be done without a sacrifice of her health and freedom. Thus she has preserved that pleasing contrast in the sexes which perpetuates their appeal for one another.

"All this is a digression and a glimpse into times far beyond the revolution but it will enable you to understand our present social values. This feminist movement was not distinct from the Revolt of Youth, but was concurrent with it. There might have been an open war between the sexes had woman not played such a glorious part in the Revolution and had not the memory of sufferings shared together in the Great Rebellion softened the bitterness of the sex strife.

"With youth triumphant a glorious era was ush-

ered in and true Socialism was established. The soul, the higher nature of man, with infinite leisure to unfold, blossomed in beauty and soared to heights of achievement hitherto undreamed of. Forever casting off the old Puritanical idea that earthly happiness is a thing to be rejected in order to purchase a hypothetical paradise beyond; man reached forth his hand and gathered the joy and plenty which has always lain within his reach. Disease and death yielded before the 'consciousness of immortality'; crime and repression vanished simultaneously with the 'consciousness of sin' and the lifting of poverty. Great inventions were perfected, making life's necessities attainable by a maximum of two hours daily labor; and man freed from the ancient curse of toil, raised his head from the ground and began to explore the infinite."

"You spoke of the monarchy," I interrupted. "Was the United States willing to surrender its long cherished ideals of democracy? In fact, very few nations had any time for kingdoms and for kings even in my day. I must admit, however," I added shamefacedly, "that we had very little real democracy."

A New World

"WHEN the world came under one government, England insisted that the highest officer in the Federation should bear the title of King. Since all the powers were making concessions to each other in order to end conflict forever, England had her way in this. She explained and rightly too, that a king was a beautiful tradition that would add majesty and dignity to a world whose late sordid utilitarianism had starved the race for beauty. The title didn't make much difference anyway, since the first King was an American, and it *does* keep alive the spirit of romance and the glamor of pageantry.

"What we really have is a Hierarchy, a perfect system in which each officer is supreme in his own jurisdiction and responsible only to his immediate head. Each officer is an expert in the duties of his office and only experts in a given sphere are eligible for offices embracing duties in that sphere. All officers are selected by popular suffrage, the vote being confined, of course, to candidates who under our rigid educational tests, have qualified as experts for the offices to which they aspire. All elections are yearly, even that of king. Each officer has an assistant, a vice-officer, who serves under him. It is really the vice-officers who are elected each year, as each incumbent is succeeded by his assistant. This prevents confusion due to frequent changing of officials as each incoming officer has had a year's thorough training under his predecessor. The king may assume autocratic power in any crisis, but normally he is simply head of the Supreme Council composed of ex-kings, in which body he casts the deciding vote.

"As I have already mentioned, we have very little government as you would conceive it, but its functions have enlarged tremendously to embrace spheres of jurisdiction outside of what your age would have considered expedient. Crime has practically vanished and with it the complex systems of jurisprudence, save as councils of arbitration and advice. Health is perfect as no sane person would think of violating its laws, hence any supervision in that respect would be superfluous. There is no longer any need of armies and navies and even the International Police Force has survived only because it adds dignity and smoothness to our functions.

"The government's chief and holiest responsibility is the direction of education, which, however, has become greatly simplified. Knowledge is now conveyed to the mind during sleep by radiographic or phonographic lectures. The subject matter is indelibly imprinted on the subconscious mind, whose memory is eternal. During waking hours the objective mind is trained by great psychologists to recover at will any detail which has been impressed on the unconscious. Since all industry is controlled and all art is created by thought-power; our chief technical training is in thought-control and direction. Great stress is laid upon athletics for a perfect mind can function adequately only through a perfect body.

"Our college course, which is compulsory, also embraces a year's voyage on one of our floating universities as a training for world-citizenship. Our students under the guidance of their instructors, visit all nations that the bonds of human understanding and world brotherhood may be strengthened. Since our lives are practically endless and since knowledge is also endless, it is arranged that after every five years of service to the State, each citizens again enters school for the purpose of adding to his education such branches of learning as he may have neglected, and such new wisdom as may have been added to our racial store. International marriages are encouraged, since long before we attained immortality, we had weeded out undesirable racial strains by wholesale sterilization. The carefully preserved superior strains in the various races have united to form a super-race. Children are still born occasionally whenever a marriage is consummated wherein the contracting parties possess qualities of genius that we desire to see multiplied. However, the case must be exceptional as we must avoid over-population.

"We cherish spaciousness too well to permit even the suggestion of over-crowding. Birth is entirely different from the horror that it was in your day. The embryo is removed from the womb shortly after conception and brought to perfect maturity in an incubator. The old relations of the sexes except for purposes of procreation have practically ceased. The great energy back of the wasteful reproduction that led at last to death, has been turned into the channels of rejuvenation. This does not imply that men and women do not love and live with their chosen mates in perfect comradeship. It does not even mean the absence of sex attraction, for, as I have told you, all our emotions have been preserved and intensified. It does mean that the divine ecstacy generated by our love for one another is transmuted to the higher planes of soul expression, whence it returns to us as children of inspiration, as the materialization of our dreams of beauty.

"We have preserved the institution of monogamy and marriage but not in an arbitrary manner, as there always have been and always will be, minds who do not adapt themselves to it. On the whole, however, you will find our world a world of homes and our marriages enduring. Why should they not be, since with the removal of all pressure, economic or spiritual, they are based on love alone? Read-

ing each other's inmost thoughts with our powers of thought discernment, with no emotions to conceal, no impurity to hide, no selfish motives to attain—we *know* when the spark has flashed between us."

As she spoke of the *spark*, her voice trembled—faltered—then raising her glorious eyes, she looked straight into mine, searching—finding—and unafraid. Waves of ecstacy surged through and over me and though many centuries flowed between us, I knew and loved and understood this woman, and her soul flowed into mine above the barriers of sensual limitation.

A World Freedom

HER voice regained its power and she continued: "Though I have digressed to explain our marriage system to you, the supervision of marriage and the selection of mates is not a function of government. It is left purely to individual choice. There was a time, far back, when in order to weed out inferior strains, sterilization was resorted to, but there are no longer any unfit. When highly superior couples meet and mate, the government may suggest that they bear a child or children. On the other hand, couples really desiring offspring, may apply to the government for a permit to bear them. Such requests are usually granted, for the depletion of population during the Great Revolt, and the further depletion resulting from the weeding out of the unfit, leaves room for the addition of several millions more to our population. Good judgment is always exercised by our people and there is not among them that mad desire to reproduce themselves, which was after all, only a magnificent gesture of defiance to death.

"An important function of our government is the supervision of popular entertainment, the judicious direction of the great leisure which we now have at our disposal, so that it may be employed constructively as well as joyously. This means so much more to us than you can realize. In your age men plunged madly into pleasure to drown the sense of frustration, the monotony of coarsening toil and the degrading conditions surrounding it. In your age pleasure was an escape from reality, with us it is the jewel in the crown of realization. Two hours we spend in service to the state, joyful and willing service in our chosen vocations. Two hours we spend in the acquisition of knowledge, which does not include our training during sleep. Three hours we spend in bathing, exercises and the care of our bodies. The balance of our time we pass as we see fit, either in the quiet contentment of our homes or in our wonderful diversions that include the drama, music, the art galleries, the astronomical observatories and above all—dancing.

"Our young people, too," I mused aloud, "were also fond of dancing."

"Yes, and why not? Is not all life the mystic dance of atoms to the music of the spheres? What higher form of worship can there be than taking part in that eternal ritual?"

"I don't think that our younger generation interpreted the dance in quite that beautiful manner." I smiled, thinking of the horrible rhythms of the jazz age.

"No doubt their minds were partially corrupted by the impure thoughts of their elders," responded Iria. "Yet the eternal urge was there, impelling them by means of rhythm to the harmonization of their spirits with the Undeviating Plan."

"Is that your religion?" I asked.

"This is knowledge. We have no religion. The very word 'religion' means 'to bind' and we are free. Religion was a ladder by which men hoped to scale the walls of heaven. We have attained that goal, in this, our earthly paradise. We have thrown away the ladder. Faith has blossomed into certainty."

"But you have no system of belief—no form of worship?"

"We do not *believe* in God, the Universal Essence, we *know* that it is within and without us. It pulses through our veins in the passion and the ecstacy life. Worship? Is not our whole life worship, is not every new attainment but a new prostration of the soul before the altar of the yet-to-be-attained!"

"Surely, this is heaven I have found," I told her, "instead of the same old earth eight hundred years beyond my time."

"There was One who said, 'the kingdom of heaven is within the heart.' Truly it is like that. A sage once sought in distant countries to find an exotic blossom to discover it had been blooming all the while beside his cottage door."

An ugly doubt assailed me like a serpent crawling through the fields of Eden.

"Still, are you sure, *can* you be sure," I questioned, "that this seeming perfection, this supreme contentment is not really the beginning of decadence? May it not be that humanity has reached the mountain-top and is going gracefully down the other side?"

"The other side!" She laughed musically. "Why we have barely set our feet upon the first slopes! We have just come through the Valley—the Valley of Illusion, and raised our eyes to glimpse the splendor of the mountain top. We have scarcely conquered ourselves and our own planet—as yet. Beyond us lies—the Infinite—worlds innumerable, space illimitable—room for the soul to grow until it includes all life, all time and all being. Why we have only recently established communication with Mars and Venus. The beginning of decadence! We have reached only the begining of wisdom—in the realization of our littleness as compared to this Vastness." She pointed to the firmament and all at once I knew that these people would never know decadence. A deep shame swept over me that in my crude materialism, I had been so beast-minded as to believe that the lifting of the burden of toil would quench the spark of human ambition.

CHAPTER V

The New City

THERIUS broke the thread of my self-reproach. "We are coming into the harbor," he reminded us. "The tale is ended, and so is our journey. The rest you can learn from observation."

I raised my eyes to the scene we were approaching. It was the port of Corpus Christi beyond a doubt. The coastline had changed but little in eight hundred years. But I was totally unprepared for the splendor of the royal city that rose before me like Venus from the waves. Ivory spires and

Illustration by Paul

Leisurely moving bright-colored passenger vehicles skimmed along, keeping a foot or so above the pavement, as though held in that position by some gravity controlling device. People equipped with artificial wings actually flew through the air.

fairy minarets flung themselves against the Italian blue of the heavens. Golden domes caught and scattered jewels of sunshine in crystal showers of light. Spacious avenues paved with vari-colored glass and bordered by towering trees of tropic foliage led away from the water's edge into seemingly infinite distances. Seductive music floated out through fretted casements, and above us graceful air-craft dipped and circled or hung motionless above the radiant earth.

Iris touched my arm. "This is Nirvania," she told me rapturously, seeming to drink its fragrance into her soul. "Nirvania the beautiful!"

Heriod laughed teasingly. "That's what they call it now," he explained. "Used to be Corpus Christi. Iris thinks it's marvellous because she was born there, but it's just what it always was, a charming little sea-port town. Just wait till you see my city—New York."

Somehow I was glad to find that mankind was still human enough to have local pride. The pleasing touch of nature brought me to earth again and we went about the business of landing.

Quite a crowd had gathered to meet us. Therius informed me that this was due to the fact that he had sent a 'thought message' ahead telling all about myself. The throng crowded about us like the happy children that they were. Without any introduction they shook hands with me and embraced me as an old friend from whom they had been long parted. I could not help noticing that there was considerable restrained mirth because of my drab-colored, uncomfortable garments, but be it said to their credit, their mirth *was* restrained.

Therius, Iris and several erstwhile companions conducted me straight to the mayor's residence which was some little distance from the pier. They made no suggestion of entering any of the numerous vehicles of transportation that were at hand and from the number of people that were sauntering along the streets, I decided that these people enjoyed walking.

All around me were evidences of a higher culture than I had ever dreamed possible on earth. It came to me that the keynote of their whole civilization could be expressed in three words—beauty—simplicity—spaciousness. There were no signs of the unsightly utilitarian structures of my day; no smoking factories, no ugly office buildings, no malodorous warehouses, no towering masses of iron and steel. Instead I saw a city of airy homes nestling in the midst of cool and verdant parks. Here and there at pleasing intervals were scattered the spires and domes of dignified public edifices that evidently served as schools, theatres, libraries and museums of art. There was no heavy traffic on the streets. Leisurely moving bright-colored passenger vehicles skimmed along, keeping a foot or so above the pavement as though held to that position by some gravity controlling device. There were numbers of people who actually flew through the air, equipped with artificial wings of gorgeous plumage that gave them the appearance of great birds. A surprising number were walking, considering the ease of transportation. Multitudes were singing and dancing in the grassy spaces or on smooth glassy platforms, to the sound of invisible music.

The absence of the frantic speed, so nerve-wrecking in my time, struck me as unusual. I remarked about it to my companion, mentioning the mad velocities of 1930.

"What was their particular hurry?" said Iris so seriously that I knew she intended no sarcasm.

Therius with his usual professorial habit of taking the answer out of one's mouth, replied for me:

"They were hurried," he said, as though settling the question for all time, "because of the brevity of life in that day. One cannot blame them for wanting to crowd as much experience as possible into their brief span. Add to this the fact that they didn't believe in their religions, as their actions repudiated any hope for a hereafter."

"Didn't believe in their religions?" I asked curiously.

"Can you imagine a sane person believing in the immortality of the soul, grieving over the dead and rushing along at 200 miles per hour?"

Come to think about it, I couldn't. "Do *you* believe in immortality?" I asked him.

He smiled. "We don't have to believe in it, we *have* it."

Further conversation was interrupted by our having reached our destination.

The Mayor of Nirvania

WIDE marble steps that would have done credit to a Doric temple led up to the mayor's palace. A great glass door swung noiselessly open as Therius pressed a button. We found ourselves in a colossal *patio* covered with movable skylights. It was paved with transparent glass beneath which flowed crystal waters in whose depths innumerable fragile fish of tropic waters disported themselves, trailing their filmy veils amid waving fern-like sea-plants and through the apertures of miniature castles. The walls were simply magnificent mirrors broken by panelings displaying paintings whose genius was supreme, and occasional niches containing statuary unsurpassed by the artistry of Greece and Rome. A singing fountain tossed its white spray into a pool in the center of the court and here the fishes came to the surface.

The only furnishings were low Oriental couches, a great profusion of velvet and silken cushions, a few low stools with Oriental carvings and quite a number of rare plants and palms. A delicious perfume hung in the air and a cool breeze was set in motion by invisible fans. Several magnificent Persian cats of an inconceivable size stretched themselves lazily in the warm glow that filtered through the skylights and a beautiful shepherd dog rose to greet us. I received quite a fright as a shaggy, majestic African lion rose from a cushion and sauntered curiously toward me but Therius allayed my fears by patting him on the head and informing me that there were no more wild animals. A few uncaged canary birds and some humming birds flew freely about the *patio* unharmed and unnoticed by the giant cats. The whole scene was as beautiful as a vision of the golden age. Liberty and light and laughter had come at last to the earth and our children's children had come into their own.

To my left a door swung noiselessly open and a young man joined us. He was tall, lithe and splendidly proportioned as were all this super-race. His features portrayed a subtle blending of the noblest qualities of the ancient Greek, the North American Indian, the Oriental and the Anglo-Saxon. The

aquiline nose was unquestionably Grecian, the high cheek-bones were those of the Indian, the soft, mysterious eyes held all the charm of Hindustan, yet something flashed in their depths that betrayed the keen alertness of the modern American. In him as in all his contemporaries, the highest traits of all races were fused into a sort of sculptured harmony of face and form.

He was dressed very much like my other companions, in a short, belted tunic of shimmering golden scales. A cloak of royal purple lined with gold was fastened at one shoulder by a jewelled clasp, leaving one arm bare. Around his head was a golden circlet set with a precious stone that resembled a sardonyx. His sandals might have been fashioned of flexible gold. On the front of his tunic glittered a symbol that must have been the insignia of his office, for he was introduced to me as the mayor of Nirvania. Judged according to his youth and his general air of quiet culture coupled with enthusiasm, he might have been a college freshman.

He greeted me as naturally as though receiving visitors from past ages was part of his daily routine. Placing his palm upward in an outstretched arm, I laid my palm on his. Smiling into my eyes, he offered me the freedom of the city in a few well-chosen words. My companions then took leave of me, somewhat reluctantly, I thought, and I was left alone with the mayor.

With something of an old world courtesy he motioned me to a low divan and placed himself beside me. He pressed a button and a handsome young man entered bearing a low table which contained a couple of jewelled food-flakes, a sparkling beverage and some foamy concoctions that would have tempted the appetite of a Sybarite. As though it were the most natural thing in the world to introduce one's servants to one's guests, the mayor presented the young man to me. This charming boy, whose name was Adrian, remarked during the course of our short conversation, that he was serving this year in the mayor's home but that next year he would enter his chosen vocation—aviation. I gathered that everybody takes turns at performing essential household tasks which by reason of the marvelous labor-saving devices, are rendered extremely light. Since it occurs that the servant in one's household today, may be the ruler of the State tomorrow, no stigma is attached to the performance of any necessary labor.

The young gentleman seated himself familiarly on a cushion, inhaling from his own food flask and chatting with us while we ate. When we had finished, he departed, taking the serving-stool with him. I must have talked two hours with the mayor, mostly answering his questions regarding my era, for he belonged to that alert, curious type of intellect that never rests until it has exhausted all possibilities of knowledge from any given subject. The room was filling with the shadows of twilight as the whole *patio* was suddenly flooded with a soft radiance that seemed to be reflected from the stately mirrors and to run along walls in quivering streams of rosy, liquid light. I was about to inquire into the source of this mysterious lighting as the mayor remarked that my unusual experiences must have fatigued me greatly and all at once I realized that I was really very tired and drowsy. He rose saying that he would conduct me to my sleeping quarters. I was somewhat surprised to observe that he was leading me up a spiral glass stairway that ended on the roof.

A Night in Nirvania

HE told me that the roof-space of practically all the dwellings in tropical lands were converted into parks and gardens in which were constructed glass sleeping porches. On stepping onto the roof I was enraptured with the woodland beauty that lay before me. Rich grass interspersed with clusters of wild flowers carpeted the entire space. Graceful trees and fern-like shrubbery half concealed several sleeping porches whose mirrored walls threw back the beauty of the scene. Little streams of water purled through glassy channels fed by an immense swimming pool in the center of the artificial aerial forest. From the middle of this pool rose to a great height the shimmering, rainbow cascade of an illuminated fountain. This, I saw, was only one of the many fountains that ascending from neighboring house-tops, lit the sky with pyrotechnic splendor.

I gazed enchanted on the vision of Nirvania as it lay spread out below me, Nirvania the beautiful! The mayor opened the door of one of the mirrored enclosures and bid me enter ahead of him. I saw that the walls were composed of mirrors within as well as without. The monotony of glass was agreeably broken by panels containing rare paintings. The porch was roofless but the mayor showed me how by moving a lever the whole covering would slide into place. There were several airy windows but no shades or curtains. In one corner was the bed, a luxurious, low divan piled high with silken coverings. A soft carpet resembling natural grass covered the floor in the middle of which was set a commodious glass pool filled with sparkling water. A button at the right, just under a thermometer, could be pressed, the mayor told me, to bring the water to any desired temperature. Another at the left released the water and still another filled the pool with a fresh supply. An immense glass floor chest contained, he told me, towels, a night robe, and a change of clothing for the morning. A food flask and a crystal water-bottle reposed on a low stool at my bedside and on another stool were placed a number of beautifully bound books. In one corner stood a magnificent cabinet whose mechanism the mayor explained to me. By pressing various buttons near the head of my bed, music could be played, the news of the day recited, views of distant places flashed upon the large wall-mirrors or thought communication established with any person on the planet.

"But," admonished the mayor, "this must be taught you, and tonight I would suggest that after your bath you press this button and turn on the sleep-producing music. This music we have so perfected that by means of its vibrations sleep is immediately induced."

He now bade me a cordial good-night and left me. Determined to heed his advice and get a good rest so that I might be fresh for the marvels that lay before me on the morrow, I disrobed and plunged into a warm, refreshing bath. Deliciously rejuvenated, I gave myself a vigorous rubbing with an immense bath-towel that I found in the glass

chest and dressed myself in the silken night robe that had been provided for me. I sought my kingly divan and tried to sleep but the mental exhilaration of the day had been too much for me. Doubting seriously that any music could quiet the mad havoc of my raving thoughts, I pressed the music button. Immediately a seductive, languorous strain floated from the instrument into my throbbing brain, lulling its wild pulsations and steeping my entire being in a sea of slumber. Waves of peace flowed through and over me. My eyes closed but my spirit floated ecstatically through Nirvanian spaces exploring dim cool caves of sleep and shadowy star-pavilions tapestried with dreams. But through it all the face of Iris smiled—the hand of Iris beckoned.

CHAPTER VI

Morning Sport

WHEN I awoke it was radiant dawn. The bright sunshine was streaming in through the windows and the melodious warbling of a thousand birds floated in from the trees outside. It was fully five minutes before I could orient myself, before I could realize that the events of the last twenty-four hours were not a fantastic dream. The door opened and Adrian entered the room bidding me a pleasant good-morning. He had come in without the formality of knocking and, I must also add, without the formality of clothes. He seemed utterly unconscious of any oversight, remarking that he was glad that I had not yet bathed because he felt sure that I should enjoy a plunge in the swimming pool with the rest. He added, with a significant smile, that Iris, who, he informed me, was the mayor's sister, had sent him for me.

At this welcome news I scrambled out of bed and began a hurried toilet while Adrian waited. "You can just grab up your garments and take them along," he suggested. Not relishing the prospect of traversing the roof-garden clad only in the glittering sun-light, I politely ignored this suggestion by ransacking the chest. There I found a glittering tunic of cloth of gold with a gorgeous purple cape that fastened at the shoulder with the usual jewelled clasp. I found also golden sandals with jewelled buckles and a golden circlet for my head. The single under-garment was of closely woven silk of a marvellous texture. I was glad indeed that I should no longer be compelled to offend the public taste with my old uncomfortable garb of 1932. With Adrian's help I soon arrayed myself in regal splendor, discovering that my garments, for all their richness and beauty, were designed with the utmost simplicity. My toilet completed, I surveyed myself before a mirror.

I was proud indeed of my reflection, and Adrian's frank smile of approval convinced me that after all, there was not so much difference between my appearance and that of the other young people of this paradise. With the exception of my short hair which a month's growth would remedy, I could almost say there is no difference at all. Without being vain, I can truthfully say that I had always been considered a good-looking chap. A passion for athletics and my four years in the Navy had so developed my body that my figure was nothing to be ashamed of. Add to this my luxuriously simple and revealing costume and the picture was all that could be desired. My companion now led me to the magnificent pool from which rose the rainbow fountain that I had so admired the night before. Many heaps of silken clothing lay scattered on the grassy banks or spread carelessly on the shrubbery.

In the crystal pool itself twenty or thirty joyous bathers of both sexes were plunging and swimming through the sparkling water. I observed with embarrassment that not a single garment concealed the shining perfection of their glorious forms. Shamefacedly, with all the false modesty of my age, though I had once thought that we had cast it all aside, I asked Adrian if it were customary to 'go in' without a bathing suit.

"What is a bathing suit?" he questioned so wonderingly that I realized that so innocent and frank were these people that they had forgotten that such superfluities had ever been worn.

"Oh, it's all right," I assured him hastily. "I won't need one."

I quickly stripped off my clothing and we plunged in together. Several young girls, among them Iris, swam gracefully toward me and challenged me to a game of water-ball. I soon forgot my prudishness and entered boyishly into the spirit of the fun.

Finally I came out of the pool refreshed, glowing and feeling as though I had bathed in the fountain of youth.

Iris came up to me on the bank, swinging her garments in one hand and shaking the shining water-drops from her glorious hair. Her unveiled beauty made me gasp with wonder and her utter innocence caused my soul to kneel in reverence before her white virginity.

"Oh, you are beautiful!" I gasped, unable to restrain my admiration, "beautiful as a sea-goddess!"

Frankly her eyes met mine. "Why—yes, I am beautiful," she agreed with disarming veracity. "All of us are so. You too, are very handsome and —a poet as well. Tell me—" she queried with a touch of feminine coquetry as old as Eden, "do you like the color of my hair?"

I raised my eyes to her shimmering ringlets, green as the ocean on an Indian summer's day and throwing back the light like emeralds.

"It is beautiful," I murmured, "and utterly in keeping with one, who to me, will always symbolize the glamor and the agelessness of the eternal sea. The sea, you must know, has always been my lady-love till—now."

Afraid of my own daring, I abruptly changed the subject. "How did your people discover this wonderful hair-coloring? I see that your hair is entirely unharmed by the process."

"We treat the pigment cells themselves and thus attain permanently any shade we desire. You see we grew tired of the same old colors and decided to improve on nature."

"By the way," she continued deftly slipping into her garments, "my brother, the mayor, wants us to breakfast with him. After breakfast he desires me to show you around the city, or rather," she confessed frankly, "I asked him to let me be your guide. He was born in New York you see, and he doesn't really see the charm of Nirvania. But I love it and I want you to see it—as I see it."

"You won't have any trouble impressing me with the beauties of Nirvania. You see, it was my city too. At least we have that bond of kinship between

us—you and I—though you are eight centuries beyond me in evolution."

An Inspection Tour

"YOU think that?" she asked incredulously. "What a mistake you are making. Why even the scientists of your day had to admit that the brain-stuff of the human race, the human mind's innate potentiality, alters but little through the centuries. The mental capacity of the Egyptian Pharaohs was as high as that of the sages and financiers of your day. We have no more *capacity* to learn than you—we have simply unfolded more of the powers that have always been latent in man. You can do likewise—in time."

"You mean then, that the gulf between us is not so impassable after all, that I may some day become like your people? Oh, I promise you," I told her eagerly, humbly, "that I shall strive, study, labor unceasingly if only I may hope that some day I may dare to tell you what is in my heart."

She laughed and from the delicate blush that suffused her features, I knew that she was not unaf-

Illustration by Paul

It looked like the den of a medieval alchemist, doubtless because of its forbidding setting, but the equipment of his laboratory was expensive and up-to-date enough in my day. I could make neither head nor tail of it.

fected by my evident devotion. "You are overestimating your handicaps," she told me, "and underestimating yourself. With our educational methods that have speeded up the process of acquiring and using knowledge beyond the dreams of your educators, a few months will witness the unfoldment of your unused capacities. Besides," her voice grew more intense—"do you not realize that had there not been in you that *something* that responded to our ideals you would never have been captured in the thought-net that we spread out yonder in the sea?"

"You mean that even Therius' wonderful invention could not have drawn me into this dimension had I not, in some degree, belonged here?"

"I mean just that. The keynote of the whole invention is attunement. Unless the rate of vibration of the thought projected is attuned to the rate of vibration of the thought it contacts, there can never be that union of energies that would produce sufficient force to draw one from one age, from one dimension, into another."

"Oh, I am glad—glad—to know this!" I told her eagerly. "Now I can hope!"

She dropped her eyes before the eager passion of my own and with girlish abandon caught my hand and raced with me across the garden and down the glass stairway to the mayor's breakfast-room. After a delicious breakfast interspersed with joyous conversation, the mayor excused himself, wishing us much adventure on our tour of inspection through the city. He added jocosely that since life was eternal it would be just as well if I didn't try to see everything at once. He also remarked that after I had browsed around the city for a few days and rested and adjusted myself, the people would like to hear me tell them all about my age and time. This pleasing task I gratefully promised to undertake, and hand in hand with Iris, the adorable, I started off with a light heart on my expedition into Paradise. Had I only known that journey's end! Had I only foreseen what would happen through my own damnable curiosity.

I saw as much in my short journey, that ended so disastrously, that it is impossible to give anything like a connected account of it. It would take years to acquire a technical knowledge of the marvellous inventions that surrounded me on every hand. Yet a single simple process was common to all. The application of the power of thought to the powers of nature. Iris informed that only the experts bothered about the technicalities of their own trade. Each individual, after acquiring a liberal education in the arts and sciences, specializes in his chosen field. An architect, for instance, studies for his profession much as an architect would do in our day, except that he need not take into account actual construction. He learns to draw his model and then, by intense concentration with the picture of his model ever before him, he transfers every detail of the picture to the marvellous crystal which reflects it back to him. Then when the image in the crystal is perfect, he removes the crystal from its tripod and re-sets it in the projection machine. Again with the aid of thought he releases from his brain an energy that literally assists the mental image toward its materialization. It is clothed in substance by appropriating the eternal creative energies that forever surround us; by attracting the free electrons that are continually seeking a positive nucleus around which to revolve.

"It is not really creation," Iris explained. "The very word 'creation' implies making something out of nothing—an obvious absurdity. That would contradict the first law of physics that nothing in the universe is ever created or destroyed by the action of forces that we know anything about. Our inventions simply utilize a process as old as nature, the transformation of energy into matter. Some day, when there is building going on, I shall show you this marvellous process in operation."

"This accounts then, for the absence of factories and complicated machinery?"

"Oh yes," she answered inclusively, "it accounts for everything."

The Strange Tower

EVERYWHERE we wandered was beauty, dignity, simplicity. Everywhere the happy, laughing people walked in the sunshine, soared through the air like birds of paradise, or sped along the glassy highways in their graceful vessels. I noted that some of these vehicles were shaped like giant swans, others like winged horses, and still others like fairy vessels of the sea. Everywhere beauty and utility were harmonized into one synthetic whole. The thing that impressed me most was the frequency of laughter; low, musical, heart-free laughter that filled the air like the melody of birds. The Happy, Laughing People—I shall always call them that. I recalled that the wild young generation of my day were also a happy, laughing folk, though heavens knows they had little to laugh about. Oh, could they only have forseen the sublime vindication of laughter that endures through tears — through heartbreak — through misunderstanding.

Having wandered more or less aimlessly through all these marvels for the greater part of the day, Iris and I came about sundown to a high hill crowned with what seemed to be a fortress of the middle ages. There was something vaguely familiar about it to me and something that filled me with a strange foreboding. Gloomy and ominous it loomed over us like the shadow of ancient evil. Sardonically and irresistibly it beckoned us and humanlike we came.

"That's one of the old land-marks," said Iris. "We have preserved a few of them because of their picturesqueness. We call this place The Hill of the Mad Inventor. Why, he lived in your own time, I believe. He was immensely wealthy and he built this castle in the style of a medieval stronghold. It is said that its very stones were brought from abroad, recovered from the demolition of an ancient castle of which this is the exact replica. The older castle was itself the outpost, they say, of a Black Magician, who of course, was probably nothing more than a scientist too advanced for his time.

"The mad inventor was once a brilliant scientist, adding much to the world's store of knowledge but in his old age his mind became unbalanced. In his madness he was supposed to have performed weird and murderous experiments, but—" she interpolated sagely, "He might not have been mad after all. Your people had a habit of classifying as in-

sanity everything beyond their range of comprehension. However, whether merited or not, the appellation stuck and so we still call this The Hill of the Mad Inventor. His name, I believe, was Peter—Peter Holden."

"Peter Holden!" I burst out explosively. "Why, I knew him! He was a professor of chemistry before he began acting queer and was asked to resign from the university. Shortly after that he either inherited or obtained by some means an immense fortune and immediately began the construction of this—this monstrosity. Thereafter all he did was to shut himself up in that crazy tower-room where he was reputed to be trying to explore the Fourth Dimension."

"All of which," commented Iris, "was not so crazy, after all. You, yourself, are now actually exploring what to you is the Fourth Dimension."

"It may not be crazy now," I admitted, "but it was then, in view of the limited resources we had to work with. However, let's explore the tower-room and see what's left of old Peter's laboratory. I've always wanted to see it, but he'd doubtless turn over in his grave if he knew anyone was going to enter it."

"I'm afraid there's not much there that we could fathom," said Iris, strangely reluctant to go, I thought. "There's just a lot of complex machinery that we know nothing about, but we have left it intact and it's all in an excellent state of preservation."

"Well, maybe I'll know something about it," I boasted, over-ruling her hesitation, or more likely taking advantage of her courtesy.

The Time Powder

OUTWARDLY bold, yet at the same time conscious of an ugly premonition hammering in my brain, I led her inside the crumbling ruin. Everywhere there was the odor of decay and strange bat-like creatures flitted around in the half-light adding a spectral terror all their own. The tower-room being my main objective, as it was the true lair of the Mad Inventor, I guided Iris up the narrow spiral stairway that led up to it. Looking back upon that mad adventure I cannot but admire the courage of this angel of the golden age, when confronted by the terror that actually oozed from the very walls of this charnel house of antiquity. There were suggestions lurking there like ghosts in every corner, suggestions of the sordidness and the ugliness that have passed away forever. If they even leered and gibbered at me, so shortly separated from that time, how much more so must they have terrorized the sensitive soul of Iris. But she gave no sign of fear, save to cling a little closer to me.

Finally we entered the tower-room itself, the scene of Peter Holden's mad experiments. It looked like the den of a medieval alchemist, doubtless because of its forbidding setting, but the equipment of his laboratory was expensive and up-to-date enough in my day. I could make neither head nor tail of it, however, for I'm no scientist, and Iris, though possessing a keener brain than many an expert of 1930, was equally at a loss to explain this complex mass of wires and tubes. A curiously carved box on a table by itself attracted my attention. Oh, how I have cursed the hour that I saw it!

"I wonder what's in that old box?" I asked her.

"I don't know. We tried to open it one day, but the combination failed to respond to our thought-vibrations. We know nothing of keys. We hated to break the lock, as the box is very rare, so we decided to wait until somebody could open it. Afterwards—we forgot all about it."

Some satanic curiosity prompted me to open that box—to see what it contained. There was something sinister about it—something about the grinning gargoyles that were carved upon it that literally challenged me to defy their hellish guardianship. I saw at a glance that the lock was not intricate and having once learned something about opening locks, from a clever shipmate, I jerked up a piece of wire from an adjoining table and after five minutes had the thing open. At first I thought that it contained nothing but a curious sort of packing that fell to dust at the touch of my hand. Finally I touched something solid and gleaming. It was a small tube made of something that resembled aluminum, but unlike the packing, the passage of time had not seemed to affect it.

Forgetting the adage that fools rush in where angels fear to tread, I unscrewed the tap and poured into my hand its full contents; a small pile of glittering yellow powder. Iris watched my every movement with a proud, smile on her beautiful face. She was enormously pleased at my prowess in mastering the intricacies of a mechanism that her people had failed to fathom.

To further satisfy my hellish curiosity I raised the powder to my nostrils, and idiot that I was, I sniffed it.

The next thing I knew, a swift dizziness rushed over me, blinding me—nauseating me—a current ran through my veins like liquid fire—a thousand electric needles seemed to prick and torture me. Through it all I felt soft arms envelop me—soft lips press mine—and a despairing voice call my name, pleadingly—fearfully and rising at last to a vibrant crescendo of terror. In spite of my almost superhuman efforts to respond to that call, I slipped painlessly into a white sea of unconsciousness.

When I awoke I found myself still in the tower room, lying on a narrow couch with old Peter Holden bending over me—shaking me, and raving like a maniac.

"You would steal into my laboratory, you young whipper-snapper," he shrieked, "though how you got through that locked door would baffle the fiends! You would open my box and steal my powder—my Fourth Dimension powder!"

He was raving now in earnest—frothing at the mouth, but I too, now in full possession of my senses, also went raving mad, and my own outburst silenced his.

"Damn you and your Fourth Dimension powder!" I yelled, rising to my feet and almost throttling him. "But for you—but for your damnable powder, I should now be where your old bones have crumbled into ashes and your Satanic laboratory is but a blot on the landscape; a cancer in a healthy world. You're responsible for my being here!" I shrieked in mad unreason, "and by Heaven, you'll send me back or I'll kill you!"

A look of utter astonishment came into my victim's eyes in spite of his evident terror.

"Let me go, you fool!" he gurgled. "Quiet yourself, and tell me exactly what you are talking about."

Reason came to me at these words. At least the realization was borne in upon me that it was no fault of Peter's but my own insatiable curiosity that was responsible for my plight.

So I sat there in the waning, spectral light of the old tower-room and told him everything. Be it said to his credit, he never expressed a single doubt of my sanity, once he had fixed his eyes upon my strange apparel. His scientific mind must have told him at a glance that an art was used in the manufacture of my garments that was beyond the science of his age.

When I had finished my fantastic tale, he jumped to his feet like a school-boy and danced up and down in unrestrained glee.

"So it worked!" he yelled, "it worked! Eureka! Eureka!"

"Undoubtedly it worked," I commented bitterly, "but it worked backwards."

"You poor young fool!" he exclaimed with frank contempt. "Can't you see that it worked according to the way you took it?"

The Return to Nirvania

ENLIGHTENMENT began to dawn. "Then that means that had I taken it here in this age, it would have transported me—there?"

"Beyond the shadow of a doubt! And since I have the formula, I can make more of it. I'll admit that I was a little hasty and cut up over losing the powder that I had on hand as I meant to have tried it out in a few days, as soon as I had found a subject for the experiment. You, thank Heaven, are the God-given *willing* subject I've been looking for."

"But how do you know that I shall be transported to that particular age instead of to another epoch infested by God knows what horrors?"

"I think I can put your faith in the same principle by which you came *back* exactly eight hundred years instead of six hundred or a thousand hundred. You see the quantity of the substance determines the length of the voyage through time, the fourth dimension. It only remains to fill the tube again with the exact quantity that it contained before."

I must admit that my faith in the exactitude of his computations was anything but unwavering. But in my soul I knew that Iris was worth the risk. Like that other Anthony whom she so admired, I was prepared to lose the world for love.

"How long did you say," I asked eagerly, "that I must wait?"

"Fully three weeks, you young thief!" he retorted his anger rising with my impatience. "And meanwhile—you get out of here, and don't show your prying nose around this place until the time is up. You can write your story while you're waiting and send it to some fiction magazine. The consummate idiots of this asinine age would never accept it as fact—but it may give some one an idea—if there is a mind big enough to hold it."

"But," I stammered, "curiosity again mastering me, "won't you tell me the principle of this—Fourth Dimension Powder?"

The old man glared at me sardonically. "I can furnish you the information, young man, but I can't endow you with the intelligence to understand it. However, your desire to know something is commendatory, so to get rid of you, I'll outline the principle, trying to put it in terms that your intellect can grasp." I made a mental comment that Prof. Holden's opinion of my intellect had always been biased doubtless by the grades I had made in chemistry.

"This powder," he began painfully as though seeking adequate terms, "is manufactured from a combination of certain Oriental drugs which acts directly upon the cerebral tissues, slowing down or speeding up the vibrations of thought. These thought vibrations, freed from the dominance of the objective senses, which are completely paralyzed at the first whiff of the powder, change the rate of vibration of the atoms of the body. Since any given organism is held together only by the affinity of its atoms, it follows that the atoms of an organism whose rate of vibration is speeded up, say to correspond with that of organisms 500 years hence—would no longer have an affinity for the predominant rate of vibration of this age. Since every atom automatically seeks the rate of vibration for which it has affinity, it follows that any organism or combination of atoms acted upon by this powder, will travel through time until it encounters the rate of vibration which corresponds with its new scientifically induced rate. The influence of certain Oriental drugs on the sense of time has long been a matter of common knowledge. Working from that point I have effected a combination that affects not only the mind, but changes the rate of vibrations of the atoms of the body. And now—" he broke off angrily, "will you get out of here? But wait! Put on what the world calls a decent suit of clothes before you go, or you'll spend your next three weeks in jail."

After helping myself to old Peter's wardrobe I at last departed, much to his grim satisfaction. After the old hermit's lucid explanation, I went with a hope in my heart and a song on my lips.

That song soon changed to sorrow when I found myself again confronted with the bitterness, the heart-ache and the mad acquisitiveness of an age that even in a few short hours of Paradise, had already become to me a horrid nightmare. I was doubly sorrowful when I realized that the remedy was all so simple, too simple. It needed nothing more than the realization that human brotherhood is the only remedy even from a selfish standpoint. Unwittingly I spoke my thoughts to some of my old acquaintances only to be sneeringly asked what kind of homebrew I had been using. I gave it up and surrendered myself to my dreams and the compilation of this narrative.

Now at the end of my probation I am mailing this story to my aunt. She will understand it, and she will know what to do with it. I have settled my affairs and after a few more interminable hours I shall be on my way to the tower-room. My tryst may be a rendezvous with death or the key to life eternal. If it is death that awaits me at the end of the trail he comes too late—too late to rob me of that consciousness of immortality that shall survive the transition of form. If it is life everlasting—life unbroken by the periodical spectre of the Ancient Foe—then I shall live it reverently, gloriously.

If old Peter is ready for me tonight, he will put a

(*Continued on page 276*)

UNDERGROUND WATERS

by A.C. Webb M.D.

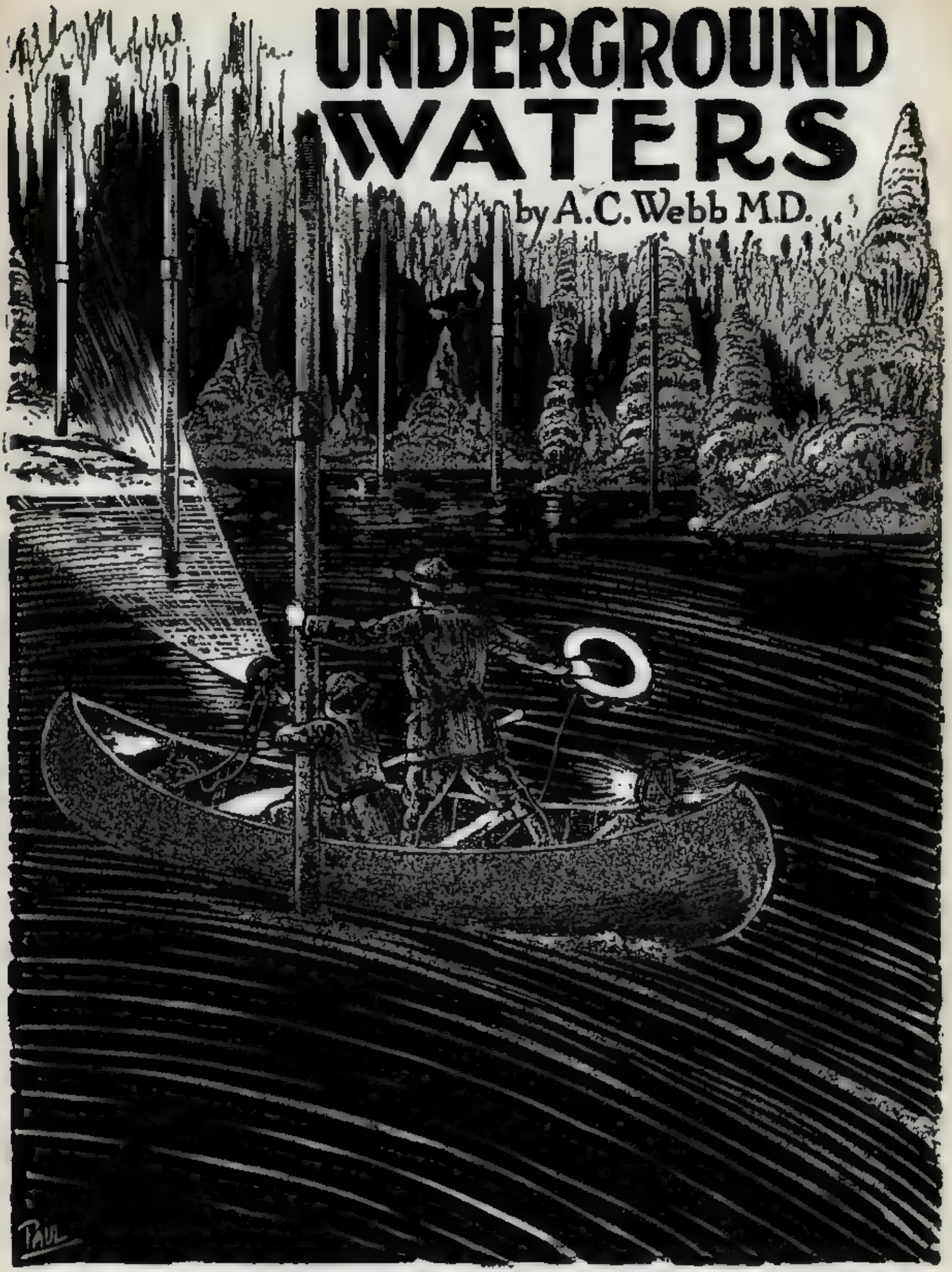

Illustration by Paul

—"It's like an enchanted palace!" exclaimed the girl, watching the weird, multi-coloured display of illumination as she turned the powerful light along the ceiling of the cavern.

"HOW do you like our water?" said the native to the stranger.

That was the inevitable question that greeted every visitor to the healthy City of Hillsboro. Other cities could boast of wonderful museums, tall buildings, of parks, boulevards and wealth. But there was not another city in the world could satisfy the aquatic needs of some fifty thousand people with an abundance of pure, sparkling, perennially cold and clear artesian well water.

And on this fact hangs our tale.

For years the supply had seemed inexhaustible. Whenever the needs of the increasing population threatened to tax the existing flow, the City Engineer simply drilled a few more wells. A peculiarity of the Hillsboro wells was that the water never rose spontaneously, as in many other artesian wells. It always had to be pumped from about three hundred feet underground. Within an area, the limits of which were poorly defined, they had always found water.

It was not until young Frank Weeks became Chief Engineer that there was any concern for the water supply. For the first time in the history of the Hillsboro Water Works Department, some of the wells had gone dry. These wells were in the eastern part of the area in which water was always found. Weeks drilled deeper and deeper in the neighborhood of these wells, but without success. Also, certain wells toward the west had gone dry, but, by going a few feet lower, they had again reached water. It looked as though the sole claim of the City of Hillsboro to international fame was gravely threatened. Furthermore, the refined tastes of the citizens could hardly be expected to relish the common, chlorinated river water that less fortunate communities were forced to drink.

So Weeks sought the aid of Professor Caldwell of the Department of Geology of the State University. Ten years previously, they had been room-mates while both were students at the University. In different parts of the world, Caldwell had made extensive studies on the "waters that are under the earth" and these studies had made him famous. The University was closed for the summer and the noted geologist readily consented to tackle the problem.

With characteristic thoroughness, the young Professor went into every detail of the situation. He examined the records of the Department over a period of forty years to determine the exact location of the underground water, as indicated by previous drillings. He scouted through the surrounding country and plotted all the artesian wells he could find on farms and country estates. Finally, he loaded his car with a varied assortment of personal effects and scientific instruments and then announced that he was going to spend several weeks in the foothills of the Alleghany Mountains, some fifty or sixty miles east of Hillsboro.

A. C. WEBB, M.D.

At such a comparatively short distance from the enterprising city, Caldwell was surprised to find himself in a region that was almost poverty-stricken. He was more interested in rocks than in people; nevertheless, his social instincts required a decent place for room and board while he was engaged in his geological survey. He looked, therefore, with dismay upon the tumbled shacks and the unkempt natives of the hills.

After driving over the rough roads for several hours, he saw a neat, freshly painted, pretentious dwelling on top of a hill about a quarter of a mile from the road. He turned and drove up to the house. As he stepped out of his car he was confronted by a tall, strongly-built young man in a lumberman's jacket and trousers of corduroy. Caldwell had heard that the people of the hills were naturally suspicious of strangers and this man's general attitude certainly did not indicate a kindly reception.

"Pardon me, Sir, but I am—"

"Professor Caldwell of the Department of Geology of the State University." A soft, musical feminine voice finished his sentence.

Caldwell turned and faced a girl of about eighteen years who had stepped out upon the porch and was bestowing upon him a most gracious smile. Profound and earnest student though he was, the young Pro-

OF all parts of our globe, the least is known of what lies beneath its surface. The interior of the earth still remains a mystery to us. What little information we have about it has come from the drillings that have been made in mines, the appearance on the surface of volcanic activity, the spurting out of geysers and of underground springs.

Much work has been done in determining the nature of the interior of the earth by exploration into caves. This has provided a source not only of scientific discovery, but also of adventurous exploration. Many rare and unusual discoveries have been made—some of them beautiful, others strange and weird—by men who have penetrated into hitherto unexplored caverns. But we believe that none of the findings of our adventurers will match those that Dr. Webb so vividly describes in the present story.

We are sure you will all enjoy it.

fessor was not to be classed among those scholarly gentlemen who, deeply absorbed in the intricacies of their science, are oblivious to the charms of physical beauty. He could not help but show his admiration for the little, auburn-haired beauty who had stepped so unexpectedly into view.

"Of course," she continued, "you don't remember me. I am just one of three hundred 'co-eds' of the Sophomore Class to whom you lectured last year."

"Why, er, Miss—"

"Agnes Conley."

"Oh yes, I remember the name all right and I remember you, too. You sat in the second row, next to the aisle—an attentive and earnest student, I must say. What a pleasant surprise to meet one of our college girls up here. I am here to do some geological prospecting for the Water Works Department of Hillsboro. It will take several weeks and, no doubt, you can direct me to some obliging neighbor who is willing to lodge and board a perfectly honest and honorable stranger."

After a moment's reflection, Agnes answered: "You must come in, Professor, and meet my Dad. Our spare room, I am sure, is at your service."

Caldwell Takes an Assistant

PROFESSOR CALDWELL received a cordial welcome from the master of the house. Mr. Conley was a native of the hills who, by industry and foresight, had amassed a comfortable fortune in the lumber business while his neighbors, for the most part, clung to their wornout farmlands or resorted to the easy but risky profits that accrue in the making of corn liquor. As the fallen pines rolled into his noisy mill, he counted the dollars for Agnes. They were all for her. She was his only child. In her he saw more and more the image of her mother who had given her life upon the altar of motherhood—an ungodly sacrifice that Nature sometimes demands to which her children are never reconciled.

"One of Agnes' teachers," he beamed; "why suh, you're quite welcome. Money? And for our hospitality, too! I should say not. You're our honored guest."

Agnes' teacher—Mr. Conley was thinking of his own village school days of long ago when the schoolmaster was the personal friend of each student. He hardly realized that in these days of mass production in education, as in industry, his beloved daughter at the great University was barely more than a name on the class roll to the eminent head of the Department of Geology.

But in the days that followed, the learned Professor and the light-hearted "co-ed" became close companions in the fascinating quest for Hillsboro's vanishing water source. In all his field geological researches in different parts of the world, Caldwell had never been blessed with such pleasant companionship. This girl of the highlands, in her close fitting boy scout apparel which she always wore on their trips, was an unforgettable picture of youth and beauty, fresh and lovely as the dew-sparkling dawn of a summer's day in her native hills.

Among the streams and small lakes that abounded in that region, one should find, Caldwell thought, a subterranean outlet that passed under the City of Hillsboro sixty miles away. Agnes knew the countryside as one who had roamed the hills and valleys since early childhood. She had more than a student's interest in field geology and she led the way to several outcroppings of limestone layers that she had previously noted.

"Now," explained Caldwell, "I know where the water of Hillsboro gets its carbonate of lime and magnesia. Some of the water from these highlands finds its way underground through limestone deposits. Wherever there are limestone deposits and underground water one may expect to find caverns. Do you happen to know of any caves around here?"

"Gloomy Cave, as it is called," promptly responded Agnes. "I have heard of it but have never seen it. It is some fifteen miles farther up in the hills."

"I must explore that cave," said Caldwell, decisively.

"I'll ask Tom to guide you through it. He knows more about it than anyone else."

Tom Moore was the tall, young man whom the Professor had met when he first drove up to the Conley home. He was the foreman of the Conley Lumber Mill. Caldwell was too anxious to explore Gloomy Cave to refuse Tom's assistance although the young mountaineer had openly shown his hostility.

The reason was not far to seek. Agnes was Tom's childhood sweetheart. They had grown up together in the hills. Tom could not accept, could not even understand a situation in which another man was taking his place at the side of Agnes. His stony, gray eyes had glowed more and more with impotent rage as he watched them day after day leaving the house and disappearing over the hills. More than once he had followed them, creeping along out of sight from crest to crest.

This growing intimacy struck deeper and deeper cords of resentment in Tom's nature. The savage that was in him—that is in all of us—began to shake off the inhibitions of civilized society. But before you condemn Tom too harshly for the evil impulse that was gaining the mastery of his mind, distorted, as it were, by jealousy, ask yourself if there has not been a time when you, believing yourself wronged or cheated in some manner, have not fingered a revolver, or felt the keen edge of a knife, or tested the weight of a bludgeon or contemplated the potency of some drug with the almost irresistible urge to personally avenge your wrongs. Tom, it is true, had other means than these in mind but that wild, impelling force, striking upward from the aboriginal ancestry of man was there and in Tom had reached proportions unchecked by any controls that existed in his own nature.

He had been wronged, cheated, cast aside. The fact that Agnes was not bound to him by any formal ties did not matter. Long association, countless little friendly acts, bound them together in a stronger union than spoken or written words could make. She had not been the same after attending the University. College training, it seems, has a way of making one dissatisfied with old environment and associates. The "home boy," playmate of her childhood, was no longer "good enough" for the college girl. All these thoughts had etched themselves into Tom Moore's mind and he was waiting and watching for the opportune time to play the favorite role of primitive man with a modern setting. "Kill thine enemy and take his cattle, his women or anything that is thine enemy's" was the first law of the jungle.

CHAPTER II

Gloomy Cave

EARLY the next morning, Tom and the Professor set out on horseback for Gloomy Cave. The entrance to the cave was in the base of a great hill that extended across one end of a long, narrow valley. With its lofty wooded sides this valley appeared, to the discerning eye of the geologist, as the bed of an ancient lake and the cave as the underground outlet of the water of the lake.

They dismounted and approached the egg-shaped entrance, dark, gloomy and forbidding. The name of Gloomy Cave was by no means inappropriate.

"How far does the cave extend?" queried the Professor.

"Don't know," answered Tom. "I've been as far in it as anybody. There is some deep water down there. How far it goes, I don't know."

"Hillsboro's reservoir, that's my guess," murmured the Professor, "the gift of a past geological age to modern man."

Tom lighted his oil lantern and Caldwell pulled an electric torch from his pocket. Thus equipped they passed on into the grotto which was about fifteen feet high and half as wide. Barely had they entered the rocky passage when two men stepped out from dark crevices on either side and barred the way with menacing shotguns. At a signal from Tom, they lowered their guns but continued to cast suspicious looks at Caldwell, who had taken a few steps backward. Tom drew the men aside and after a few minutes of earnest conversation, they withdrew into the shadows.

Moore then beckoned Caldwell to follow, but the latter hesitated. His scientific ardor was suddenly cooled. Reports of violent deeds had come from the hills. Perhaps, he thought, it would be wiser to come back another time with a larger party better prepared for emergencies.

Tom laughed at the Professor's discomfiture.

"Why," he said, "they are some friends of mine."

Friends of Tom Moore—that was hardly a reassuring recommendation to Caldwell and, since he still hesitated, Tom came closer and lowering his voice said:

"They are only a couple of moonshiners. The hills are full of them. This gang has a monopoly of Gloomy Cave. They hide their liquor here. I have given them the word and they won't bother you. Come on."

As if for further assurance, one of the men reappeared but, instead of a shotgun, he carried a large, clay colored jug in one hand and a tin cup in the other. Praising the merits of his concoction, he poured out a generous portion which Tom gulped with evident delight. Professor Caldwell declined with thanks.

Being thus assured, Caldwell followed Moore through the winding passage which led steadily downward. The rockbound walls of the grotto were smooth and the floor was covered with sand.

"I can see," said the Professor, as he studied the passage by the light of his torch, "that water has flowed through here over a long period of time."

"There ain't never been any water in this part of Gloomy Cave," answered Tom positively. "My grandfather, when a boy, played in this cave; so did my dad and so did I."

"Nevertheless the signs of the action of water are unmistakable," replied the geologist.

Tom shrugged his shoulders in disgust. This crack-brained stranger, he thought, claimed to know more about Gloomy Cave on one visit than all the Moores of three generations.

Following the tortuous passage, they penetrated deeper and deeper into the earth. It was fully two miles long and ended in a deep circular chamber. The water in this chamber blocked further progress. Caldwell's torch showed that the water escaped through another corridor leading from the opposite side of the chamber.

"We must explore that stream; we must follow it to its outlet."

"You are welcome to the job," answered Tom, grimly. "I go this far and no farther. I ain't planning right now to take chances on any water this far in the ground."

Caldwell's light penetrated the clear water to a considerable depth.

"The water," he said, "wells into this chamber through porous layers of sand and gravel, but where does it go; that's what I want to know."

"Follow it down and find out," urged Tom.

Caldwell looked at his watch. The flash of his torch showed a picture of Agnes on the open lid. Tom saw it and his face grew hard and hostile.

"I still have time," said the Professor, "to go down to Hillsboro to see about getting a boat and some other things that would be useful in exploring this cave. We shall return tomorrow."

The Professor Explores

AND on the next day, Caldwell had a canvas covered canoe, light and strong, floating on the underground river. In the canoe was an elec-

tric storage battery which supplied current for a powerful automobile headlight with which he could illuminate the cave for a great distance. He also had an old fashioned lantern like Tom's, well filled with oil. Tom had helped him bring the boat down to the stream but preferred to remain ashore until the Professor should return.

Caldwell paddled his skiff through the smooth, glassy surface of the water. There was a barely perceptible current leading through the outlet on the opposite side. With all the hopes and fears of one who journeys into unknown realms, he directed his canoe boldly through the yawning tube. Because of the winding course of the stream, he soon lost sight of Tom and his yellow light.

As an added precaution he had arranged, with the use of two loud toned automobile horns, a simple code of signals. One horn was left with Tom; the other he had in the canoe. They were to keep in touch with each other by sounding their horns. If he should run into a labyrinth of streams and corridors and lose his way, he could always tell, by the volume of Tom's answering horn, whether or not he was getting farther away from the entrance to the cave.

He paddled along leisurely for about four hours without finding anything more striking than an underground stream of unusual length. Several times he stopped to take soundings with line and plummet or to chip specimens of rock from the walls with his spalling hammer. He passed several caverns opening into the main corridor but his light showed them as blind alleys. The irresistible urge of the born explorer to ramble farther and farther into the unknown was upon him, but the growing faintness of Tom's horn warned him that it would not be wise to go much farther alone.

He was just about to turn his canoe around when the sweep of his torch showed him that a few yards further the corridor seemed to end abruptly. He paddled cautiously onward to what appeared to be empty space. The cave suddenly widened into gigantic, impenetrable stretches and the river flowed silently and smoothly into a vast underground lake. He was now in a chamber of almost unearthly beauty and grandeur. He played the beams of his light upon the lofty roof fully forty feet above him, studded, as it were, with innumerable points of reflected light and decorated with stalactites and crystals of gypsum in fantastic, architectural designs. And all the enchanting beauty of this subterranean firmament was mirrored in the still waters of the lake beneath.

"The action of water on limestone deposits," mused the Professor, "operating through countless years, has carved this masterpiece. I shall explore this lake to its farthest shores, but not alone."

Reluctantly, he guided his canoe back into the grotto and rapidly ascended the placid stream. He could picture the long, curious throngs that, in the years to come, would journey into the hills and down through the winding passages to behold the weirdly beautiful limestone temple discovered by Professor Henry Caldwell.

Tom awaited and was anxious to know how far the Professor had been and if he planned to make other trips. He was assured that other trips would certainly be made until the water had been traced to its outlet. Tom then asked a few canny questions, the general trend of which gave Caldwell the impression that Tom evidently knew more about the cave than he cared to admit.

When Caldwell reached the Conley home he found an enthusiastic listener in Agnes. In fact, she insisted in seeing the wonderful chamber the very next day. In the meantime, the Professor called up the University and instructed two of his assistants to come to Hillsboro and make the necessary preparations for an extensive underground voyage. He needed two more canoes and an extra supply of batteries and torches; for, should their lights fail while they were out on the lake they would be doomed to aimless wandering in the abysmal darkness.

While waiting for his assistants, Caldwell promised to carry Agnes as far as the lake and no further. Tom, with a face that alternately scowled and grinned, watched them as they pulled out upon the dark stream.

Our voyagers proceeded leisurely through the inner corridor. Agnes guided the way with a torch, illuminating with childish delight each rocky crevice. They had almost reached the lake when the enthusiastic queries of the girl were sharply interrupted by a dull boom that reverberated through the corridor. There followed a series of muffled explosions, the rocks trembled, fragments fell into the water.

Caldwell, bewildered, involuntarily looked up at the walls and roof as though he expected them to fall.

"What could have happened?" he finally uttered.

Agnes, true daughter of the hills, was remarkably calm.

"That was dynamite," she replied, "I have heard it often. Father uses it to blast stumps. Perhaps they are blasting on the surface above."

"It sounded much nearer, the first explosion at least, as though it occurred right in the cave. Perhaps the moonshine gentlemen had a still hidden in the outer corridor and it may have exploded."

CHAPTER III

Trapped!

CALDWELL gave repeated signals on his horn but there was no answer from Tom Greatly alarmed, he paddled his canoe rapidly up the stream. A few hours later a strange and unexplicable sight confronted them—an impassible mass of shattered rock and loosened earth choked the outer passage.

"And where is Tom?" exclaimed Agnes.

"Buried in the corridor, no doubt, while trying to escape; and we are left entombed."

"Oh, they'll dig us out," was the cheerful response of the girl.

"It sounded like several explosions," continued the Professor, "and I would not be surprised if most of the corridor is blocked. It will take a long time to reopen it, weeks, perhaps months even with the best of machinery which will have to be brought from Hillsboro or even from Louisville. Thousands of tons of earth will have to be removed. We are three hundred feet beneath the surface. If our exact location were known, they could sink a shaft down to us in not many hours. But who knows where we are? Let me think. I must find a way out of this hole."

He sat upon a rock, deeply buried in thought, while Agnes busied herself casting pebbles into the water. Finally, he arose and started toward the canoe.

"Let us explore the lake," he said. "It must have an outlet somewhere. If we do not find it, we may come back here and wait."

He helped her gently into the canoe and rowed swiftly through the long and now familiar passage. When they reached the great chamber with its scintillating roof and mirrored lake, Agnes gasped in admiration and wonder.

"It is like an enchanted palace!" exclaimed the girl, watching the weird, multi-colored display of illumination as she turned the powerful light along the ceiling.

Caldwell himself was moved to admiration, not however for the beauty of the cavern, but rather for the vibrant enthusiasm of his companion who was so singularly free from apprehension. He wondered if she realized fully the extreme gravity of their plight. Anxiety was already deepening the lines on his own face.

"The roof," she continued, "is like a diamond studded veil. It is beautiful, exquisitely beautiful."

"Dear Agnes," said the Professor, gravely, "it will not be so exquisitely beautiful if we do not find a way out of here. It will be a tomb for you and me."

But this grim reminder by no means dampened her spirits.

"A tomb," she echoed in mock solemnity; "well then, what a gorgeous mausoleum for two ordinary mortals. No king could wish for more."

At least he was free to think about the hard problem before him. He was a man accustomed to hard thinking and he was no stranger to perils. In his many explorations in different parts of the world, he had faced death more than once. Much as he admired his companion's cheerful spirit, he was in no mood to share her enthusiasm. The myriad points of light that yesterday had seemed so gorgeous were now mocking and taunting him; the beautiful chamber assumed the aspect of a gloomy and oppressive vault; the long, grotesque, fingerlike projections, sweeping down from the roof, were painfully suggestive of an impending and inescapable doom.

Caldwell placed his oil lantern on a rocky shelf near the mouth of the stream and then directed his canoe across the lake.

"If our batteries should fail," he explained, "this light will guide us back. If our friends break through the outer corridor, they will follow the stream and this light will let them know that we are somewhere out on the lake."

They had covered about a mile when their light revealed a rocky shore stretching away on either side into the darkness. A few yards beyond the edge of the water the shore curved gently upward and became continuous with the roof.

"Let us follow the shore toward the right," said Caldwell, "because as nearly as I can judge that is the general direction of Hillsboro. I think that this lake has some connection with the water supply of the city, although I am not so interested in that right now as I am of finding some means of getting out or at least letting the world know where we are."

He pulled out into deeper water so as to avoid the many rocks that jutted above the surface near the shore. He did not want to run the risk of damaging the canvas keel of his canoe. After more than four hours' anxious paddling, Caldwell's keen hearing caught a peculiar, gurgling sound. Before he could locate the origin of the sound, his canoe turned sharply to one side, pitched violently forward and began a dizzy circling course.

"A whirlpool!" he gasped, pulling frantically at his oars. But the force of the current swept them round and round nearer the deep treacherous center. By the flash of the light, that Agnes with rare presence of mind kept sweeping about them, Caldwell caught sight of a thin column of rock—at least he thought it was rock—extending straight up out of the water near the center of the whirlpool. He watched for his chance and when the circling motion brought them close enough he grasped this column and, with a supreme effort, brought the canoe hard up against it. Holding on by sheer force, he directed Agnes to take some rope that he had brought along, pass it around the column and tie the skiff securely to it. Safe for the moment from the engulfing vortex, they sat silently watching the whirling mass.

Finally Caldwell spoke: "If we get out of this water trap, we'll be two lucky mortals."

"It is a trap within a trap," mumrured the girl; but her voice was steady and there was no indication that she had lost her nerve. "If it were not for this friendly rock—"

"It's not rock at all," interrupted the Professor, who had been examining the shaft. "It is iron, a man-made iron pipe. I can feel the steady vibration of a pump. Water is being drawn up through it. It is one of the artesian wells of Hillsboro. We are under the city."

"A well!" she ejaculated. "Well! what do you make of that?"

She followed the long, straight pipe with her light until she saw that it pierced the roof.

"And there are others, too!" She had discovered three more extending down into the lake.

Tom Confesses

CALDWELL noted that one of the pipes entered the water not far from the brim of the whirlpool. This suggested to his acute mind a method of getting out of the maelstrom. As a part of the equipment of the canoe there was a lifebelt with a light but strong rope attached. Giving the rope plenty of slack, Caldwell threw the belt up and into the water beyond the pipe that was near the edge of the whirlpool. The current brought the belt back to the whirlpool on the opposite side of the pipe. Then by twirling the rope, he managed to throw several loops of rope over the floating belt. When he tightened on the rope the belt was pulled up against the pipe and the rope was fastened securely thereto. It was then comparatively easy to pull the canoe out of the whirlpool.

And then, to their utter dismay, it was discovered that the canoe was taking water. The violent contact with the pipe in the whirlpool had damaged the canvas keel. He paddled hurriedly toward the shore which they reached before the boat was swamped.

"There," said Caldwell, pointing to several pipes that extended down from the roof but stopped at varying distances short of the floor, "are Engineer Weeks' dry wells. The level of the lake has gone down, leaving those wells high and dry."

When Agnes and the Professor did not return for the night, her father mounted his horse and hurried to Gloomy Cave. He discovered what he thought was an ordinary "cave in." He immediately collected a force of men and attacked the choked corridor with picks and shovels. Urged on by the almost frantic father of the lost girl, the men toiled all night and all of the next day.

It was soon realized that their primitive methods would take too long. Weeks, the City Engineer, and other friends of Caldwell took charge of the rescue and had ponderous excavating machinery, hauled up to the cave. Their efforts, also, were fruitless.

The plight of the girl and the Professor became one of the great newspaper stories of the year. The big dailies and press syndicates rushed reporters to the scene. Early newspaper reports, it will be remembered, stated that Tom Moore, the guide, was also entombed. One of the moonshiners, however, who had used the cave as a rendezvous voluntered the information that he had seen Tom Moore leave the cave hurriedly just a few minutes before the series of explosions that precipitated the "cave in."

Meanwhile, Tom had disappeared. His description was flashed over the country. It was three days before he was "picked up" in Louisville. He offered no alibi, no defense, no denial.

"I was so much in love with her myself," he muttered, "that the thought of her loving somebody else must have drove me crazy. I put sixteen sticks of dynamite all along the passage. They had long fuses and I lighted 'em as I ran through. I hope they don't find 'em. I didn't want anyone else to have her. I don't care what they do to me."

When asked to draw a diagram of the corridor in order that they might sink a shaft beyond the closed part, he stubbornly refused.

"It's a long deep cave," he said. "I've been all through it; nobody else has, far as I know. There's a long river that runs into a lake. In the lake there's a whirlpool. If they get caught in that, it's no use to dig 'em out."

When asked the location of the lake, he closed up like the bivalves of a clam and no amount of pleading or inquisition could make him say more.

Tom had done his diabolical work so thoroughly that it was impossible to follow the course of the shattered passage. Weeks sank several shafts, using an extremely rapid process that he had devised, but only solid earth was found. Squads of men, in relays, continued to dig into the earth while sharp-eyed newspaper men reported their feverish efforts to a waiting world. Curious throngs, from near and far, gathered. Some cheered the toiling men; a few volunteered their services, while many criticised or offered inane suggestions. Improvised lunch stands and soft drink counters, sprang up like mushrooms. Even the moonshiners surreptitiously profited.

After ten days of almost ceaseless toil, Weeks returned to Hillsboro. He had not given up hope. He had left orders for the work to continue. He had worked himself to the limit and exhausted nature demanded rest. He wanted at least one full night of sleep and gave orders that he was not to be disturbed. But early the next morning, an urgent call from the Water Works brought him to the telephone.

"Hello," he answered peevishly.

"Hello, Chief. This is Morris. Sorry to disturb you. Know you need the rest. Something very important has happened. I have a message for you from Professor Caldwell."

"A message from Caldwell! Then they have found them!"

"Not exactly, but we know where they are."

"What do you mean."

"I mean that the Professor and the girl are three hundred feet in the ground right under the Water Works Plant."

"Preposterous!" ejaculated Weeks. "What makes you think that?"

"For several days," replied Morris, "small pieces of paper have been appearing in Basin No. 2. We thought some crank was trying to contaminate the water supply, so we watched carefully. They continued to appear and we found that they were being

pumped up through Well No. 16 which, as you know, is one of the pipes that discharges into Basin No. 2. All of these pieces of paper had some scribbling on them but we paid little attention to that. This one I studied more carefully. It looks like a page torn from a pocket notebook. Listen: 'Weeks, this is from Caldwell. We are down in a cave that has a big lake in it from which your wells get their water. For God's sake, dig us out'!"

Weeks could not repress an incredulous snort: "Some fool is trying to play jokes on the Water Works Department."

"No, Chief," answered Morris, earnestly. "This is no joke. We thought so at first and I had all the pipes that drain into Basin No. 2 guarded day and night. These notes keep on coming, and they must be coming from underground through Well No. 16."

Weeks expression changed abruptly.

"I'll be right over," he said. "Get in touch with the boys up at the cave. Order them to pack up immediately and bring all that special shaft sinking equipment back to the Water Works."

Rescue

WITH all possible speed, Weeks hurried to the plant. He found Assistant Engineer Morris in a high state of excitement.

"Here's another one!" he cried. "It came up just a few minutes ago."

He handed Weeks a wet, crumpled piece of paper. The latter smoothed it out and read:

"Please help. Our batteries are almost out. The darkness, cold and hunger are getting the best of us. Talk to me through Well No. 5."

"Well Five," said Weeks, "that's one of the dry wells over in the eastern section."

He dashed over to the well, trailed by Morris and others. This well had been abandoned for a long time. It was nothing more than an empty, three-inch pipe in the ground. The piston, plunger and other parts had been removed. A cap had been screwed over the end.

"Remove that cap," ordered Weeks.

While workmen hurried to get their tools, Weeks began to beat upon the pipe with a piece of iron. After several blows, he placed his ear against it. He was overjoyed to hear faint but distinct taps in answer.

As soon as the cap was wrenched off, he yelled down the pipe:

"Hello! hello! Caldwell!"

"Hello," answered a hoarse, weak voice.

"Well, Old Man, responded Weeks, cheerfully, "we've found you at last. We'll dig you out of there in a jiffy."

"Please hurry," came from the voice in the earth. "We are cold, hungry—been in darkness most of the time, trying to save our batteries. This darkness is maddening. Agnes is very weak but still brave. Can't you send some hot chocolate down through this pipe?"

"Hot chocolate? Well, I could, but there are some old, rusty, partly closed valves in this pipe. Would take time to knock them loose—time better used sinking a shaft. My method will bring us down to you in a few hours. Three hundred feet are only child's play. Got to get busy now. Will call you later. Don't worry. Cheer up."

Weeks' method of sinking a shaft was all that he claimed it to be. He had tried it out at the cave with startling results so far as speed of operation was concerned. The machinery with its skilled workmen was being brought back to Hillsboro as rapidly as possible. It consisted of a steel cage, six feet square, open at the bottom. This cage was lowered by cables from above as workmen in it tore up the earth with pneumatic drills. No time was lost removing the pulverized earth and rock; powerful vacuum tubes literally blew it to the surface. Because they were sinking a shaft into an empty cavern, the men in the cage wore safety belts attached to the top of the cage. Thus they would not fall through the cave when its roof was broken in. Other men, using the top of the cage as a working platform, timbered the walls as rapidly as the shaft was made. Pumps kept the shaft free from water.

In less than four hours, Weeks had his equipment in full operation.

Again he called Caldwell.

"We are coming down, Old Man, right alongside this pipe at the rate of fifty feet an hour. We'll be with you in six hours—maybe less."

"Great work," answered the underground voice, "I feel stronger already, just to be able to talk to someone up there in the warm, bright sunlight. And say, Weeks, your wells are going dry because this lake is getting lower. It is getting lower because it has eroded its outlet, making it larger. The outlet is marked by a whirlpool. No doubt there is an intrusion of softer rock there in the bed of the lake. Now if you will place some controlling works around this outlet, you can preserve your water supply. Furthermore—"

"Oh, never mind all that. What we want to do now is to get you and the girl up here as soon as possible. Now rest easy. We will soon be there."

Caldwell, far below, turned wearily from his end of the pipe which came down to within two feet of the floor of the cave. The cold, damp prison had held them captive for eleven days but they had lost count of the passage of days and nights. For food they had the raw, blind fish of the lake, against which their stomachs rebelled. He had tried to build a fire from parts of their useless canoe, but an all-pervading dampness prevented combustion. He had tried to signal by tapping on the pipes within his reach but no one had heard, or hearing, failed to understand. Well No. 16 was near the shore, so he waded out to it repeatedly and sent his messages for help up with the rising water.

Rescue was now on the way. He crawled over

to Agnes who lay very still on the ground. He had wrapped her up in his coat to keep away as much of the chill and dampness as possible. By the faint glow of his fast-failing torch, he studied the pinched, pallid features of the girl who had shared his strange perils. He touched her lightly and she opened her eyes.

"Agnes," he said, "we are saved. My messages finally were heeded. Can't you hear them coming down for us, beating on that pipe nearer and nearer? Be brave, dear child, just a little longer."

"Have I not been brave?" she queried, half chidingly.

"Yes," he hastened to add. "You have been wonderful. But, tell me, were you not at all frightened?"

"No," she whispered, and her face was brightened by the lingering radiance of a smile. "I was not afraid. Why should I have been, for I knew that you would find a way."

THE END

Into the 28th Century

(*Continued from page 267*)

light in the tower-room. The shadows are deepening, creeping around me, languorously, caressingly, bidding me farewell. Even now I would turn back —were men not blind; would they only listen. For I have known a love that has taught me that even its own surrender is preferable to a duty cast aside. But the time has not yet come for the Message to peal forth from the Inner Temples of the Heart. Many Christs must still be crucified, many sages must go down to death, before man, the Eternal Prodigal returns from his weary journey among the husks and ashes to find the flower that he has sought in a far country, before his very door.

Ah! it is there! The light! But it is more than a light to me—it is a summons from the infinite. It is a challenge to plunge into the fathomless—to dare the Causeless—to live beyond the Law. More than all this, it is the call of Love. Across the deeps of time I hear the voice of Iris—the welcome of the Happy Laughing People, and I come! Bride of the centuries—I come!

Take me to you.

THE END

A MESSAGE TO ALL . . . LOVERS OF SCIENCE FICTION

There is a big treat in store for you. Be sure to turn to page 280 as well as page 284 of this issue.

HUGO GERNSBACK, *Editor.*

New Book Club Cuts Price of Month's Leading Books to 42c

By ARTHUR K. WHITLEY

NEVER before in the history of book publishing has there been so wide and varied a deluge of important—really significant—books. A recent list of best-sellers includes such names as Julian Green, Susan Ertz, John Galsworthy, Hugh Walpole. There is no doubt that American readers want good literature, and are willing to read any amount of good books—if they are within reach.

But so many books are published each year that it is almost impossible for the average reader to buy every volume he would like to own. As a result, hundreds of worthwhile volumes are overlooked—due to the "high cost of literature."

Why are books so expensive? Why can they not be sold as cheaply as magazines? This has long been the problem of a group of distinguished writers, educators and publishers.

The Writer said: "The author's earnings do not increase the price of good books. He would much prefer having 50,000 readers purchase his book for 42c a copy than only 5,000 at $2.50."

The Educator said: "Free public education has given the average citizen an appreciation of good books. More fine literature is being read today than ever before."

The Publisher said: "If enough buyers can be secured in advance, I can publish important new books, have them artistically designed, durably bound—and sell them for 42c a volume, or 1/6 the present prices."

And so the writer, educator and publisher conferred with printers, artists, distributors—*and worked out their plan.* The result is: *Paper Books.* This is a wonderful new book club that provides one outstanding volume a month—12 important, notable books a year—for the unheard of price of only 42c a volume! The books average 300 pages and contain as many words in as large type as the average $3 or $4 book.

Thousands upon thousands of readers who never dreamed that fine books, beautifully designed and printed could be sold for only 42c a volume, have already become charter members. After subscribers received their first two selections, "The Golden Wind" by Takashi Ohta and Margaret Sperry, a fascinating novel, and "Frederick the Great" by Margaret Goldsmith, a vivid, *full length* biography—letter after letter came to the Editorial Board expressing amazement that such a publishing feat could have been accomplished.

The New York *Times,* writing of the first Paper Book selection says: "Not only is 'The Golden Wind' remarkable for a most unusual and successful blending of East and West in romantic narrative, but its selection marks it as a portent in American publication. With cover and end-papers designed by Rockwell Kent, it is a distinguished piece of work, compounded of good paper, clear type and well bound."

The newest *Paper Book* selection is "Dewer Rides" by L.A.G. Strong. This novel is creating a sensation in England where it has received greater praise from critics than any other novel in recent years. Selections like these more than justify the original plans of this remarkable new book club. Now everyone can enjoy a whole year's distinguished reading—*for less than the price of two books;* and still have sufficient in their book budget to buy other volumes that may interest them.

Some of the men responsible for this wonderful new publishing innovation are: Padraic Colum, famous author, Everett Dean Martin, distinguished educator, Lincoln Colcord, eminent critic, Louis Untermeyer, outstanding American editor, poet and critic, Horace M. Kallen and Charles Boni.

Rockwell Kent, art editor, and Elmer Adler director of printing; are responsible for the beauty and artistry of the volumes.

The largest number of charter members ever to subscribe to a book club have joined the *Paper Book Club.* Membership is now open to all. Through this club anyone can purchase the leading books of fiction, history, biography, poetry, philosophy, travel—*for only 42c a volume!*

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What I Have Done To Spread Science Fiction

(*Continued from page 149*)

WITH the next two issues of SCIENCE WONDER QUARTERLY, the publishers will give $340.00 in prizes to the winners of an entirely new contest in which every reader of this magazine can join.

In publishing a number of science-fiction magazines, the editors feel that they have a great mission to perform; their mission being to get the great mass of readers, not only to think what the world in the future is likely to become, but also to become better versed in things scientific.

But it is impossible for us to succeed in our mission unless our science-fiction readers preach the gospel of science fiction, wherever and whenever you have a chance to do so.

The select group of science-fiction readers which now exists is a marvelous nucleus for a far greater mass of readers that are yet to come. It would seem to be a great privilege for the present group to spread the new gospel far and wide.

Many readers are, of course, doing this already; but they are not anywhere near numerous enough, and it is for this purpose that we have inaugurated this prize contest. All we are interested in at the present time is to spread the gospel of science fiction.

The prize contest might, therefore, be headed by the caption, "*What I Have Done to Spread Science Fiction.*"

In the next two numbers, three prizes will be given, as follows:

FIRST PRIZE $100.00
SECOND PRIZE $50.00
THIRD PRIZE $20.00

A total of over $500.00 for the three issues of the QUARTERLY. The closing dates for the two remaining contests will be Feb. 15, 1930 and May 15, 1930.

It will be run as follows: In the Spring, 1930; Summer, 1930 issues of SCIENCE WONDER QUARTERLY we will award the prizes for the best letters, *with the accompanying proofs*, of what our readers have done to convert others to science fiction. The efforts that our readers put forth may be in the way of talks before clubs or school classes, letters written to friends or relatives, letters to local newspapers, etc.. The proofs and letters that are offered should be as conclusive as possible; in order that the editors may really judge adequately the merits of the contestants. The proofs may be clippings from newspapers, letters from editors, friends, relatives, subscriptions obtained, etc. All material in this contest must be addressed to Editor, Prize Letter Contest, SCIENCE WONDER QUARTERLY. Understand that *this is not a subscription contest.* Our purpose is only to convert others to the cause of science fiction.

The next series of prizes and letters will be published in the Spring issue of SCIENCE WONDER QUARTERLY. The prizes will be based on the evidence offered and the sincerity and enthusiasm of the contestants as expressed in their letters. No letter should be longer than 500 words. In case of a tie, an identical prize will be paid to the contestants so tied.

FIRST PRIZE $100.00
CORRESPONDENCE IS HIS METHOD

Many months ago, in an early issue of your former magazine, I read an article or letter submitted to the "Discussions" department.

This article outlined a suggestion for an International Science Club. From this idea, I conceived another, *i.e.*, the forming of a Science Correspondence Club. With this in mind, I gathered all the back issues of the magazine.

I had clipped out all the letters which appeared in the "Discussions" in regards to the formation of a Science Club. I then wrote all these individuals and, in addition, submitted a letter to the editors in which I outlined my plan of having each member who was a reader of the magazine, the only science-fiction magazine present at that time, to make an effort to get together all the individuals in his or her city interested in science and science fiction, and organize small clubs in their respective cities. In this manner, widely scattered groups could spread the idea further and further and more laymen of the day would become interested. Upon inquiry as to how these little clubs came into existence, from the local representative, he would find that the idea originated through the reading about and writing to individuals connected with the magazine. **Now there are four of these great, new magazines in publication, three of which are under your direction.**

My method is to spread the idea of science and science fiction by correspondence. Whenever a name appears in the "Discussions" or "Reader Speaks" department of a science fiction magazine, indicating that the author of the letter is interested in science and science fiction, I immediately write and explain the idea of our club and ask him to interest everyone in his city that he may know or can learn of, in science and the popular explanation and ideas of science conveyed in the greatest literary idea a man has conceived of in this generation! Science fiction! through efforts in my home town or local branch has been organized and is progressing rapidly.

Correspondence and a lot of it is my method of spreading the idea and use of science fiction. It has succeeded to a degree far beyond my expectations and will continue to succeed indefinitely. The great, new, and heretofore obscure branch of World Literature, Science Fiction is here and here to stay!

Let our motto be—sow the seeds of science fiction and science in every fertile mind, and you shall reap the reward of benefitting your fellow man!

Walter Dennis
4653 Addison St.
Chicago, Ill.

(Attached to this prize letter were copies of letters received by Mr Dennis from people desiring to join the Science Correspondence Club. The letters indicated that they were inspired by Mr. Dennis' communications with them. There is no doubt in our minds that the Science Correspondence Club is one of the greatest organs for the spreading of science fiction today and we unhesitatingly award Mr. Dennis, the originator of the club, the first prize.)

SECOND PRIZE $50.00
POUNDED REMORSELESSLY AT MEN

I am one of those who approached science fiction with scornful eyes. I had been brought up to regard what is known as fact as the absolute limit of our knowledge, and the theoretical imaginings of science fiction authors struck me as being the ebullitions of disordered minds. However, in order to more fully understand this strange phenomena, I once purchased a magazine—the June issue of SCIENCE WONDER STORIES—and I read a story called "The Reign of the Ray." Immediately, something strange and inexplainable struck through my consciousness. I saw, as a panoramic view, the great influence that science would have on future wars, and I determined to learn all about that particular subject that I could.

I went to Wells, the grand old master of imaginative scientific literature, and read his "War in the Air," and many other of his masterpieces. With no more Wells to devour, I returned to SCIENCE WONDER STORIES to see if my sudden change in outlook had been merely a transient affair, and, to my surprise, I became enamored of those glorious and visionary flights into the future that were presented to me through your pages.

I am an extremist by nature, and also the type of person who, when he possesses a secret, must transmit it to others. Suddenly awakened to the meaning of science fiction, I was astonished to learn that my friends either knew nothing of it, or scoffed at it. They were all like myself—young men, well educated, and not hidebound by traditions in their thought, but science fiction was one thing they could not assimilate.

I remember it was one evening in the summer when a half dozen of us were gathered together (the names and addresses are attached hereto for your verification), and I had just finished reading your editorial on "The Wonders of Gravitation" in the July issue of SCIENCE WONDER STORIES. I do not know what possessed me at the moment, but, as we got into a discussion on the subject, I found myself making an impassioned speech in defense of science fiction. As usual, I was met by incredulity and scoffing, but, at the end of our rather heated argument, I felt that I had made some headway. From then on, I pounded remorselessly at these men, bought them magazines, read to them passages from stories, and defied them to deny the truth of the prophecies made in the stories.

Earning my next year's tuition at college working for the Post Office Department of the Government, I continued my propaganda during my working hours with the result that the following men (the list of names is also attached here, but please do not print them unless necessary) took out subscriptions to SCIENCE WONDER STORIES and AIR WONDER STORIES. My tally shows that I have altogether eighteen subscriptions to your magazines to my credit, and I should say about ten other persons are converts, although not subscribers. I am sure that a number of them buy their magazines surreptitiously, as they may not be willing to admit the full extent of their conversion.

I am now in my second year at the University of Alabama, and here I have carried on my work among the students. It seems that the very force of my belief seems to have an influence on those I speak to, and I am always at a loss to understand why people will not see the value of science fiction immediately when I tell them about it. That, I suppose, is one of the mysteries of the mind that we have not yet been able to probe. For relief from the often overpowering monotony of life, for exercise of the intellect and the imagination, for mental speculation and conjecturing, and for dramatic adventure, science fiction is unbeatable.

It may seem to you that I am "piling it on" in order to convince you of my right to one of the prizes, but I am sure that if you write to the people whose names I have given you, they will be only too willing to confess to you that at times I become a terrible bore with my enthusiasm. Irrespective of whether you consider me worthy of a prize, I assure you sincerely that science fiction has been a revelation to me, and that is the reason why I think I will be always indebted to you.

Victor Saunton,
University of Alabama,
Tuscaloosa, Ala.

(This is one of the most fervent and most sincere letters that we have ever received from any of our readers. Being, of course, so completely sold on science fiction, the editors can feel with Mr Saunton in his enthusiasm. We are sure that our readers will thoroughly concur with us in awarding him the second prize).

(*Continued on page 281*)

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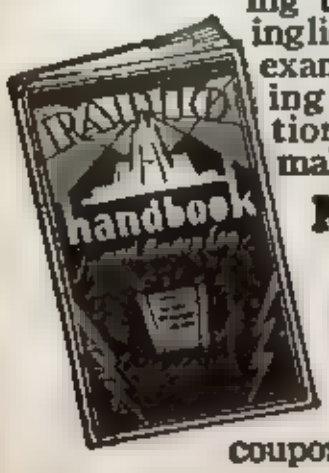

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WHAT I HAVE DONE TO SPREAD SCIENCE FICTION

(*Continued from page 278*)

THIRD PRIZE $20.00

A MATTER OF PERSONAL CONTACT

It seems to me that I have always had an inclination and liking for the unusual, the unique and the imaginative.

Before the introduction of your incomparable monthly magazines of science fiction to the reading public, I had avidly devoured anything savoring of science fiction. My first efforts in this direction was the reading, amassing and re-reading of Edgar Rice Burroughs' novels. Then in swift sequence followed Jules Verne, H. G. Wells and H. Rider Haggard classics.

As these became exhausted, I turned my attention to the magazine field and immediately my mind became focused on your periodicals, "The Electrical Experimenter" and "Science and Invention." It was then that I first met "Baron Munchausen," "Ralph 124C41+," "Ark of the Covenant" and many others. These small bites of science fiction only whetted my appetite and made me hunger for more. Following this desire, I started reading "Argosy All Story." This magazine acted me many excellent stories including Farley's Radio stories and sequels. Most of Merritt, Ray Cummings, Garret Smith and a host of others. I have kept them all and now have quite a few. These stories are at your disposal for reprint purposes. I collected and have read every one of your periodicals.

The conversion of my friends to the cause of science fiction was simple once they realized its advantages and its pleasant means of scientific instruction. They were ready converts insofar as the desire for the unique and unusual was inherent in them. My first convert was Fred Krause. As soon as I had fired his imagination and his curiosity, I loaned him one of "our" magazines. He became so fascinated and interested that he subscribed immediately. At present he has nine years of subscription to your science fiction periodicals. The next in line to be converted was Sol Tabb who now has five years of subscription to "our" magazines. I myself have seven years of subscription. Next in line was Herbert Potell who though not a subscriber avidly follows the stories. Following him came Morris Miller who now thanks me for introducing him to the delights and wonders of your magazines. I am now trying to convert Leo Lyons with a very good chance of succeeding. All the minor details concerning each of these conversions will be found in the letters written by each converted friend which accompanies this report.

All this is only the material side in spreading science fiction. I have also written letters to editors of scientific magazines (wholly or partly) asking them to reprint certain science fiction classics, but although I receive courteous answers, my suggestions were never fulfilled. Recently I took up and completed the gigantic task of classifying the hundreds of science fiction stories that I possess.

I have found to my surprise and astonishment that the friends I have converted to the cause of science fiction have in turn converted others to the same cause. Therefore it is my belief and hope that the spreading of the gospel of science fiction will go on forever unabated in its enthusiasm and thus will convert the entire world and mayhaps other worlds too.

Julius Unger,
786 Blake Avenue,
Brooklyn, New York.

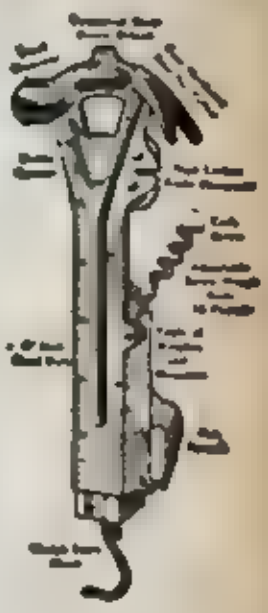
(Mr. Unger's method is the personal one. His friends and relatives must share with him the good things he possesses. The letters attached to his entry attest to this. We congratulate him and award him the third prize.)

A MESSAGE TO ALL LOVERS OF SCIENCE FICTION

There is a big treat in store for you. Be sure to turn to page 280 as well as page 284 of this issue.

HUGO GERNSBACK, *Editor.*

Ten Tools In One



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SCIENCE FICTION CLASSICS

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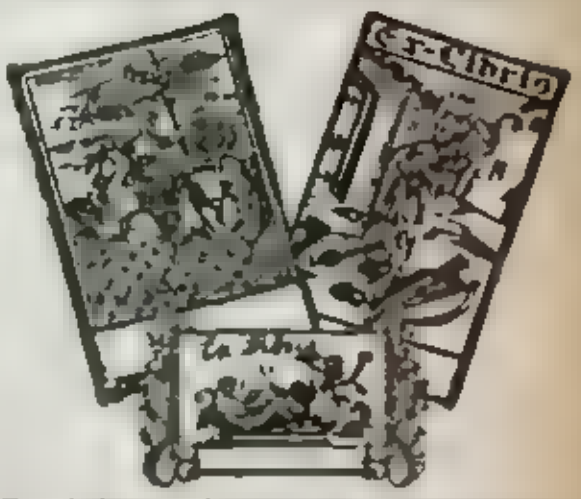

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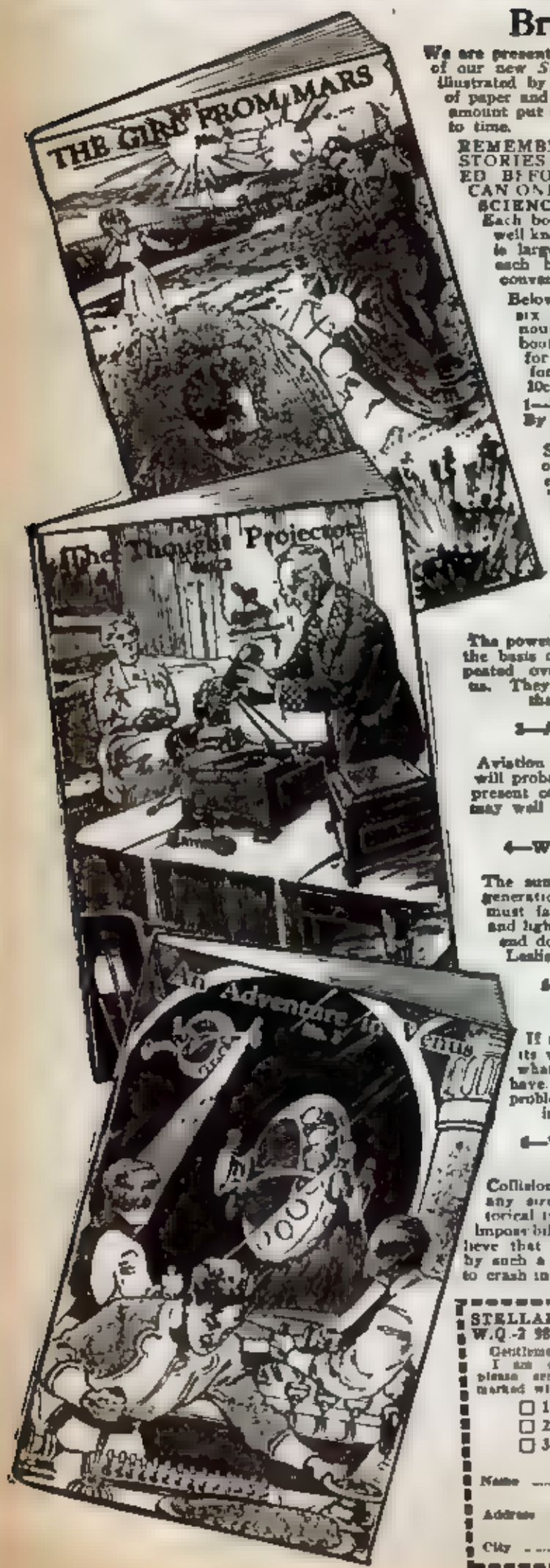

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The Reader Speaks

In SCIENCE WONDER QUARTERLY *only letters that refer to stories published in the* QUARTERLY *will be printed.*

The Greatest Interplanetarian Story

Editor, Science Wonder Quarterly:

I do not pretend to know anything about science or astronomy but to my mind "The Shot Into Infinity" is the greatest interplanetarian story ever written. It does not have to be in a future setting but right in the present time. Most of those stories are based in the future and usually begin with the ship already constructed. This story, however, makes you live with the inventor, in his struggle to finance his proposed trip. Truly "The Shot Into Infinity" can rank at the top of all science fiction.

I liked "The Hidden World," except for the part where the earthmen, in their one globe, wiped out nearly all the Flesh Creatures. That ranks with these western and crook stories, where the hero wipes out regiments of "bad men" and comes out unscathed. The author laid it on too thick, I think. But your first edition of SCIENCE WONDER QUARTERLY went over big with me and I wish it every success.

Your covers are very good. Nothing wild about them, and Artist Paul is the one man for the job. I like your idea of printing the author's picture with every story, too.

Here's to your magazines, the whole three of them. Here's to more great stories. Here's to all the departments, "Science News," "Editorials," "The Reader Speaks," etc. Carry on!

Dana L. Paulin,
1387 Pearson Ave. W.,
Ferndale, Mich.

(Mr. Paulin's point is well taken. The difficulties, at present, in persuading moneyed people to finance the building of a space ship for mere scientific knowledge would be pretty great. There are any number of *Vacarescu's* who would be willing to gamble for commercial advantages. The way of the inventor of a space ship is truly not one lined with roses. Otto Willi Gail has brought this out very convincingly.—*Editor.*)

Striving to Advance Science

Editor, Science Wonder Quarterly:

Although I have already received the first SCIENCE WONDER QUARTERLY, I was glad to get your circular, and I will give my vote on the reprints. As you publish SCIENCE WONDER STORIES, giving the readers plenty of science fiction which has never been read before, I think that it would be well to give us some of the reprints.

I will comment on the first issue of the QUARTERLY. "The Shot Into Infinity" is truly a masterpiece. I believe that Mr. Gail must have read your article in the monthly on space flying before he wrote the story. I don't think that I have any criticism on the story itself.

"The Hidden World" was very interesting; but as for its scientific value, it's just a bunch of clap-trap, just as most of Hamilton's works are. In contrast, Mr. Gail is striving to advance science rather than to give a bunch of pseudo theories in connection with some scientific fact, to make the story sound plausible.

(*Continued on page* 285)

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"The Pilot A.C. Super-Wasp," by John Geloso. A practical receiver with A.C. "drive."
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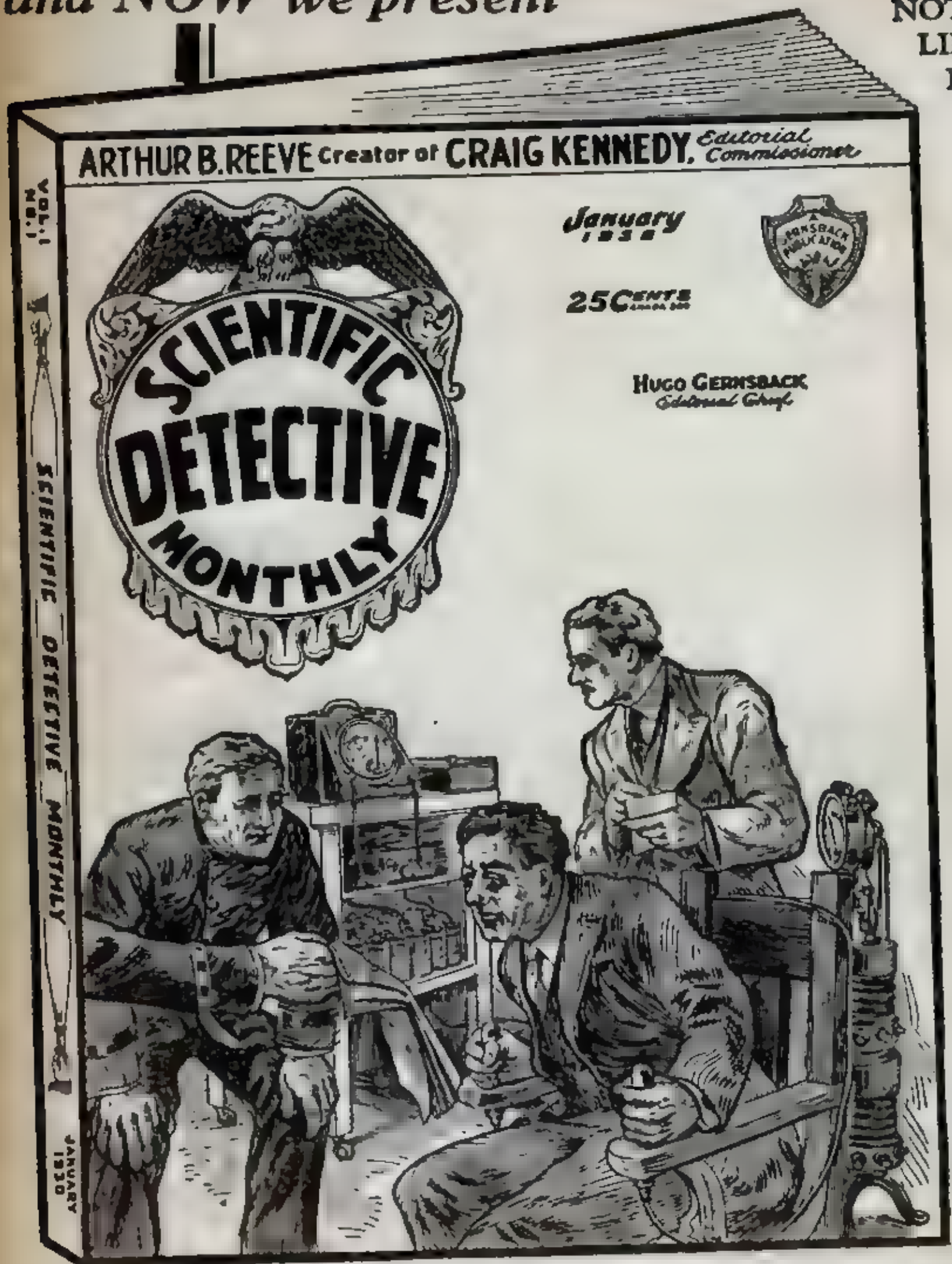

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The Reader Speaks

(*Continued from page 283*)

All of Mrs. Harris's works are very good, but she is overworking herself as are Keller, Repp, and Vincent. "The Artificial Man" contains some good prophetic science along the medical line; but I don't believe that man should replace parts of his body by machinery till necessary.

I enjoyed "The Gravitational Deflector," but I think that it is a little rash to give theories of something of which we know nothing. However, Einstein has upset things so much that one man's theory might be as good as another's.

I was glad that you published my letter in the QUARTERLY, and I would like to hear from some of our readers who are Fundamentalists.

I believe that you should not publish an AIR WONDER QUARTERLY. I have read the first few issues of the monthly, and I find that the steady flow of "air" is monotonous. I am glad that you are publishing another set of science books in November. (I mean the science fiction series.)

Orville Woodward,
1609 D Avenue,
Newcastle, Indiana.

(Mr. Woodward is quite right in his estimate of Otto Willi Gail. Associated as he is with the leading German scientists, and a scientist of no mean attainments himself, he gives us the best and latest that there is in science. He is making a reputation that will exist even to the time when these things that he writes about will be commonplaces.—*Editor.*)

Better If Written By An American

Editor, Science Wonder Quarterly:

The first issue of SCIENCE WONDER QUARTERLY was great. I liked "The Hidden World," by Edmond Hamilton, better than any of the others. There was action all through the story. I read it through without stopping to take a drink of water—as I have to do when reading some stories. "The Shot Into Infinity" was good, but not as good as I expected it to be. If written by an American it would have been much better. You can't beat American authors when it comes to writing science fiction stories.

The illustrations were great. I liked the gold cover—put it on every issue. If you ever put out an AIR WONDER QUARTERLY, give it a silver cover.

Of your three fiction publications I like SCIENCE WONDER QUARTERLY best, AIR WONDER STORIES second, and SCIENCE WONDER STORIES third.

Jack Darrow,
4225 N. Spaulding Ave.,
Chicago, Ill.

(From one point of view, Mr. Darrow is right when he states that "The Shot Into Infinity" would have been better had it been written by an American. We agree that it might have been more exciting for the moment. But then, after the initial excitement wore off, there might be little left to remember. It is usually that way. And although "The Shot" may not make one's hair creep, it is the sort of story that grows on one with time, like any masterpiece of art. And so Mr. Darrow will find himself going back to it with more and more eagerness. Incidentally, it is our policy to present to our readers the best in science fiction from the different countries.—*Editor.*)

Some Possibilities

Editor, Science Wonder Quarterly:

Your magazines are all fine. I wish you the best of luck. The story in the QUARTERLY, "The Shot Into Infinity" and "The Hidden World," and all of the other stories are fine.

Some stories you can print in your SCIENCE FICTION CLASSICS are the following:

"The Flying Legion," George A. England; "The Golden Blight," George A. England; "Palos of the Star Pack," J. U. Giesy; "The Mouthpiece of Zitu," J. U. Giesy; "Jason, Son of Jason," J. U. Giesy.

These three last stories by J. U. Giesy are the best Interstellar stories I have ever read

"The Radio Beasts," Ralph Milne Farley; "The Radio Planet," Ralph Milne Farley. These are interplanetary stories of the possibilities of radio. The name "Farley" is merely a nom de plume.

And there are some fine stories by Roy Cummings, which were published by you a long time ago. "On the Brink of 2000," Garret Smith; "After a Million Years," Garret Smith; "Treasures of Irontalus," Garret Smith; "Cloud Hawk," Garret Smith; "The Planeteer," Homer Eon Flint; "King of Conserve Island," H. Eon Flint; "The Sun Makers," William F. McMorrow; "Venus or Earth," William F. McMorrow; "The Ship of Ishtar," A. Merritt; "The Moon Pool," A. Merritt.

Mr. A. MacDermott,
2745 26th Ave.,
Oakland, Calif

Mr. MacDermott has indeed given us a goodly list of possible "reprints."

We are glad to note that, like practically all of the readers of the QUARTERLY, he was pleased with "The Shot Into Infinity," and "The Hidden World."——*Editor.*)

Marvelous! Wonderful! Superb!

Editor, Science Wonder Quarterly:

I would be very grateful to you if you would solve the following problem for me:

A = MARVELOUS.
B = WONDERFUL.
C = SUPERB.
A B C = ?

I am convinced after reading your new "Quarterly" that the answer is SCIENCE WONDER, but I am not absolutely sure that my answer is right as it is mentioned that reprints may be used in issues to come. If this is true, then I will know that my solution is wrong but if "our" magazine is left just as it is, then I will know without doubt that my answer is correct. DON'T PRINT REPRINTS.

But if more votes are received for than against them, then by all means print only stories by Edgar Rice Burroughs, A. Merritt and Ray Cummings.

I shall anxiously look forward to the date when the new set of the Science Fiction Series is announced.

Forrest Ackerman,
San Francisco, Calif.

(Mr. Ackerman certainly leaves no doubt as to where he stands on the reprint question. Regarding the stories in the QUARTERLY, we are quite amazed to find that although the stories were universally liked, there were not the expected number of criticisms. Were there no brick-bat possibilities in them?—*Editor.*)

(*Continued on page 287*)

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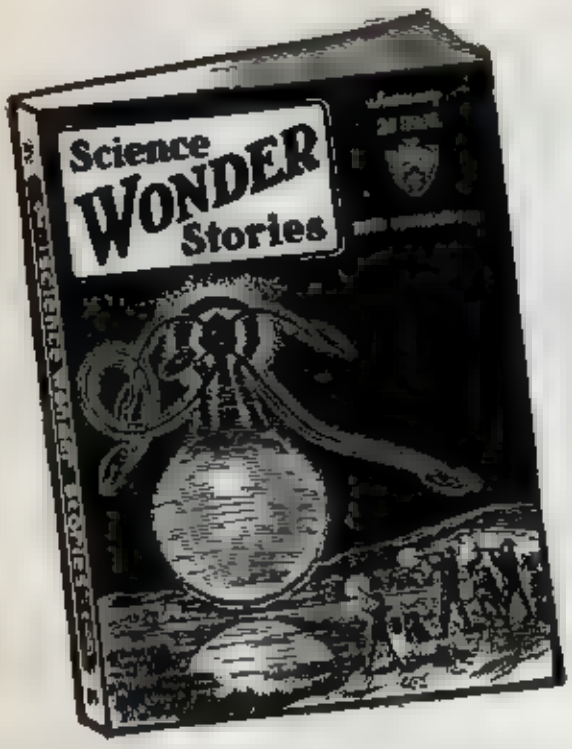

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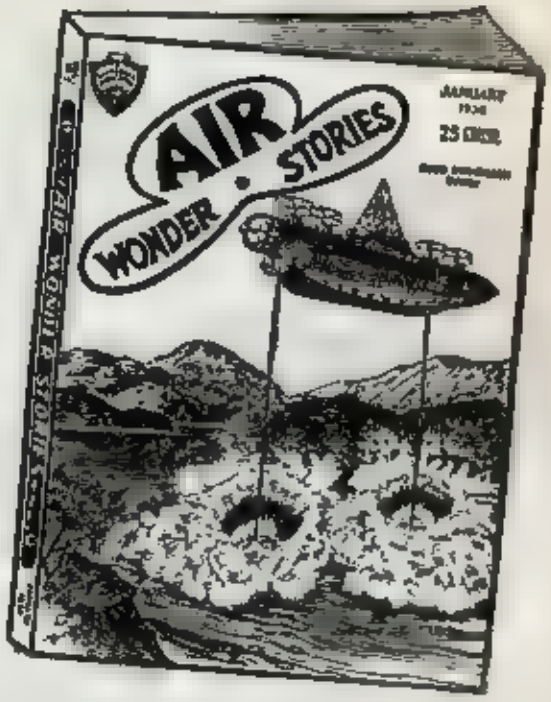

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The Reader Speaks

(*Continued from Page 285*)

Where Is the Center of Gravity?

Editor, Science Wonder Quarterly:

I have been reading your science fiction magazines for several years but have never dropped you a line to tell you how much I like your various magazines.

I have seen 16 summers, am a junior in high school, like almost every type of science and would like to hear from any one else on their theories, etc.

The first copy of SCIENCE WONDER QUARTERLY was great. I could pick few flaws in "The Shot Into Infinity," although "The Hidden World" had one or two inconsistencies. For instance, the author states that the center of gravity of the outer earth is somewhere within the great shell, therefore the ocean could not flood the great fiery sea; water will not flow against gravity.

I am glad to hear that the novel length story will always be an interplanetarian story.

I would like to see stories by Edgar Rice Burroughs, A. Merritt and H. G. Wells on the list in the future. Don't you think Jules Verne's works are mostly cold facts now?

Wishing you success, I am

Richard Gowin,
Vienna, Va.

(In "The Hidden World" the center of gravity of the earth is supposed to be located within the shell. But Mr. Gowin must remember that the gravitational force as reckoned on the surface is still "down" or toward the center of the earth sphere. Therefore, all bodies on the surface according to Mr. Hamilton's theory, could act just as they do now, believing as we do that the earth is solid.—*Editor.*)

Sequel to "Shot Into Infinity"

Editor, Science Wonder Quarterly:

Permit me to congratulate you on your latest (but not last) success, namely, SCIENCE WONDER QUARTERLY. You have produced another magazine outstanding in its class.

You are not alone in your praise of Otto Willi Gail's signal triumph, "The Shot Into Infinity." It was excellent, and your translator knows his job. Is it possible to get more from Mr. Gail? Perhaps a sequel to this story?

The science contained in Clare Winger Harris's "The Artificial Man," was, in my opinion, good; but the plot highly improbable.

"The Hidden World," by Edmond Hamilton, is another classic in science fiction. That is the kind I want, and I believe I may say "we", your readers, want. Give us more. Keep Hamilton in sight.

H. D. Parker's "Gravational Deflector" was good. How is it all our authors who incorporate some forms of "gravity nullifiers" in their stories have overlooked the problem of centrifugal force, as brought out by Mr. Parker in his story?

I don't recall the author's name, but in one of your former magazines "The Menace From Mars" appeared. This, I still believe, is one of the finest science fiction stories ever written. Incidentally, by reading that story in a magazine loaned me by a friend (truly a friend), I became an ardent science fiction enthusiast. Try to give us some works from the author of "The Menace From Mars."

What in the world has become of Stanton A. Coblentz? It seems as if he has faded from the picture.

I have no suggestions to make concerning your magazine, save that I would make it longer; bulkier. There should be at least (and really more) twice the number of pages in it compared with the Monthly. Give us new stories only. Keep your covers; it's all right. Isn't it possible to secure a better grade of paper?

Wallace Wardner,
131 S. Washington St.,
Hobart, Okla.

(We have already in our hands a sequel to the "Shot Into Infinity"—it is called "The Stone From the Moon." In many ways it is better, more daring, and more thrilling, than the "Shot." Korf, the hero of the "Shot," grows to scientific maturity and his inventive mind conceives such devices that in their scope will leave us breathless. That is all we can say about it at present. Watch for an announcement of its appearance—*Editor.*)

Wings Among the Stars

Editor, Science Wonder Quarterly:

In regard to your voting contest in connection with the QUARTERLY, I am in favor of new stories only, for I simply dread a long story written by H. G. Wells. To see the main story in the QUARTERLY written by Mr. Wells would be a shock to me. In the first place, mostly all of Mr. Wells stories are laid in England and the dry-as-dust conversations these Englishmen carry on certainly give me a pain. Any other authors are welcome.

I have absolutely no kick to offer in connection with your magazine, either with the name, size of book, paper or what not; as I am so tickled to death to get a magazine with stories about anything in the scientific realm that anything you do is O. K. with me. You certainly will be my friend for life if you continue the policy of making an interplanetarian story the long novel-length story in your QUARTERLY. This type of story is hashish to me and when I start one, especially one of Edmond Hamilton's, I depart from this earthly sphere and wing among the stars in utter contentment.

Joseph A. Miller,
428 Althea St.,
Pittsburgh, Pa.

(That we can make Mr. Miller "wing among the stars" is surely an indication of our power that makes us tremble. To be worthy of such power, we must use it carefully. That means to provide the best that there is in science fiction.—*Editor.*)

Short But Sweet!

Editor, Science Wonder Quarterly:

Allow me to congratulate you upon your wonderful publication. In the future I predict that your life will be studied by school children, as one of the greatest workers in the origination and spread of science fiction. I wish I could write stories like "our" authors. "The Shot Into Infinity" was the model, the star science fiction story. It was downright wonderful—perfect!!

Robert A. Ward,
544 E. 38th St.,
Baltimore, Md.

(Mr. Ward's comments were short but sweet. We agree with him heartily—that is on his comments about "The Shot Into Infinity."—*Editor.*)

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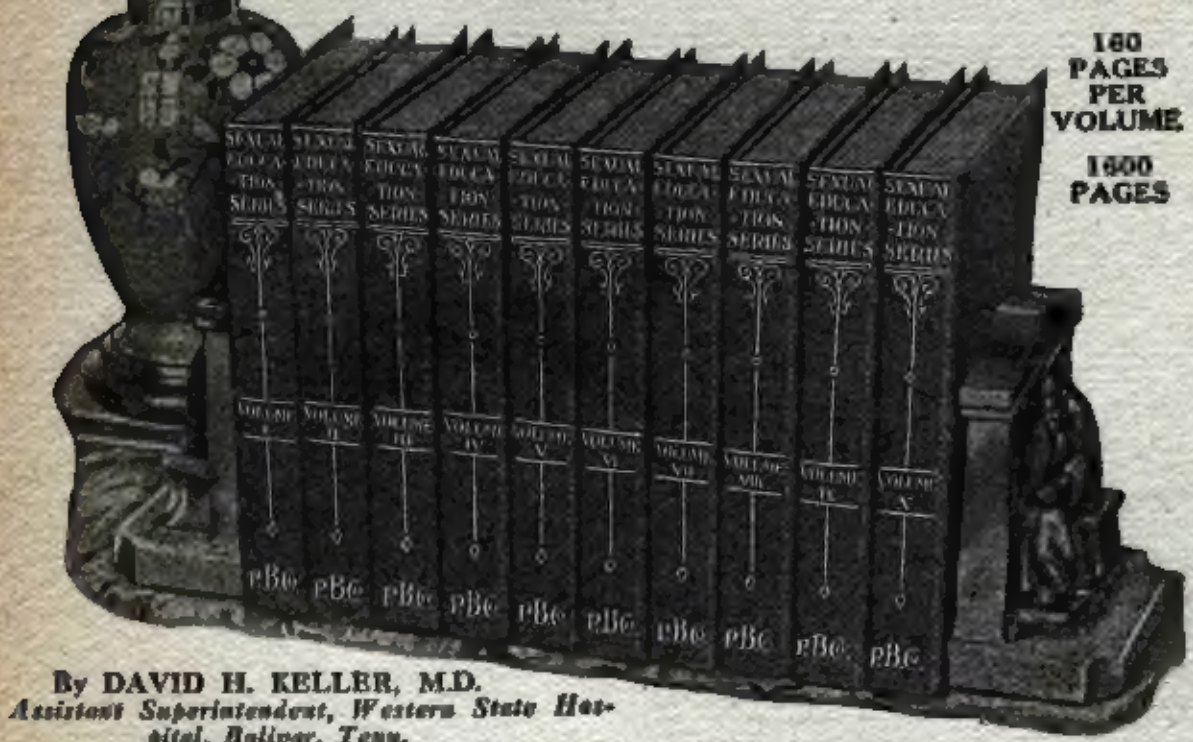

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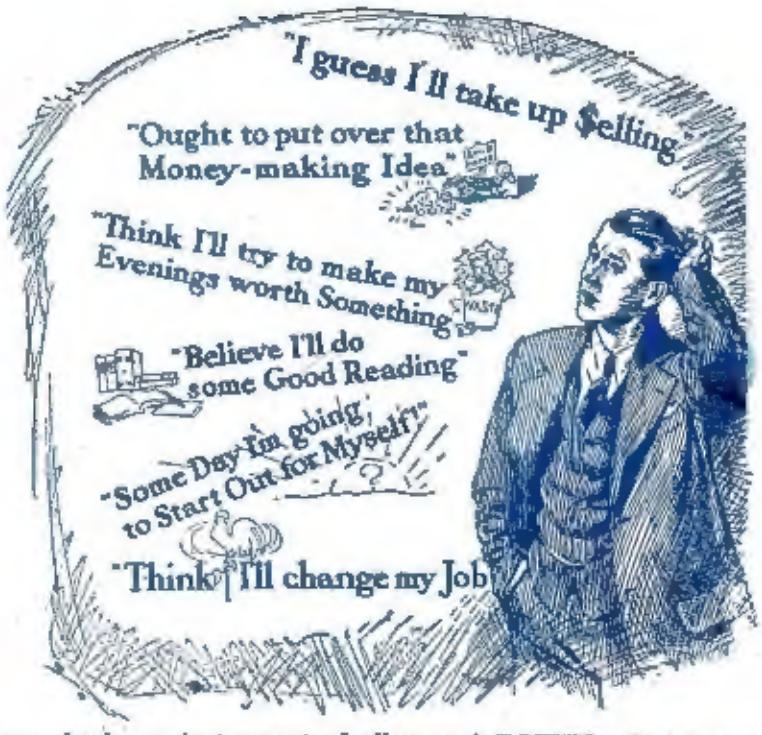

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My Inkograph is the first and only writing utensil I ever owned that I can use with pleasure. To be without it for any time would upset my business day. is has always worked perfectly. I have never had any difficulty with it. Arthur L. Fox, Centerville, Mich.

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